

May 14, 2019
BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA
REQUEST FOR PROPOSAL (RFP) #Y19-1057-SW, ADDENDUM NO. 2
RECYCLING CONSULTING SERVICES

This Addendum is hereby incorporated into the bid documents of the project referenced above. The following items are clarifications, corrections, additions, deletions, and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining and deletions via ~~strikethrough~~.

A. Questions and Answers:

QUESTION 1 : Does the County plan to remove the MWBE requirement? The WMBE requirement is essential for the possibility of minority participation in this project. Two of the four consultants that attended the pre-proposal conference today were certified Orange county minority companies and qualify to participate in this project.

ANSWER 1: See response to Addendum #1, question 1.

QUESTION 2: If possible please provide a copy of the Waste Composition Study performed last year.

ANSWER 2: Study is attached to Addendum #2.

QUESTION 3: General: Would the County be able to extend the deadline for submission of proposals by 1 week (to May 30)? This RFP is seeking a significant, rapid commitment and we would appreciate an extra week.

ANSWER 3: Yes. The Division approves this request. The RFP due date has been extended to Thursday, May 30, 2019 no later than 2pm. Proposals will not be accepted after this revised due date and time.

Question 4: Sec 1, Paragraph 5: It is possible that some subcontractors would not customarily carry all of the listed insurance (e.g. Prof Liability). Please confirm that subcontractors should only carry the insurance coverages which pertain to the role they are playing.

ANSWER 4: Tasks 3 & 6 warrant errors and omissions coverage/professional liability. The County agrees that the coverage for the subs can be based off of what role they are playing. However, all subs should definitely carry the standard insurance requirements to include Commercial General Liability, Automobile Liability, and Worker's Compensation.

QUESTION 5: Sec 2, II. Task 2.a.i. Please clarify that the County will guide the identification and selection of routes and streets to be audited and will provide route maps and/or path route data from its GIS system and the consultant is not expected to generate this information.

ANSWER 5: The County will identify target areas and provide route maps of areas to be surveyed for each event to the Consultant in electronic format.

QUESTION 6: Sec 2. III. A.7. Would the County consider extending the ramp up to 20 personnel from 60 to 90 days?

ANSWER 6: The County will allow ramp up to 16 people (estimated as four field teams) to be completed in 60 calendar days (if requested by the County), with ramp up to 20 (estimated as five field teams) personnel in 90 calendar days, (if requested by the County).

QUESTION 7: Sec 2. III. B.4. Please clarify what, if any, of the data listed here is collected by the County-provided software and handheld, and also confirm that the consultant will have access to this data.

ANSWER 7: Software will collect data on raw numbers related to tagging effort. Consultant will be required to perform data analysis and provide anecdotal information.

QUESTION 8: Sec 3. M/WBE We understand the County is considering the removal of the W/MBE goal. We have no opinion on this action.

ANSWER 8: See response to question 1 of Addendum #1.

QUESTION 9: Sec 3. Page 7. Par E. This section indicates that letters of intent must indicate the percentage of overall contract fees to be contracted. Yet, the work will be performed on a Delivery Order basis. Hence it is not possible to know at the time of proposal submittal what the percentage will be. Please clarify that the proposal should state the general scope of work to be performed, but that the percentages will be determined individually for each Delivery Order.

ANSWER 9: In this case, the firm's proposal is based on the general scope of work to be performed. Therefore, the percentages should be based on the overall total estimated bid, per the Bid Response Form. Please see your firm's completed bid response form to determine percentages if necessary.

QUESTION 10: Sec 3. Page 9: Middle paragraph reads: "Proposers may be awarded a maximum of five (5) bonus points for a commitment to hire displaced workers residing in Orange County, Florida as full-time employees for the duration of the contract." However, work will be assigned and performed on a Delivery Order basis and it seems possible that the contract may be in effect for

periods of time when no Delivery Order is under way. Can this sentence be modified to read “for the duration of the Delivery Order”?

ANSWER 10: No, these are bonus points. In order receive the bonus points, the displaced worker (s) much be hired to work for the duration of the project.

QUESTION 11: Location Form: Please clarify what is to be filled out for the Prime Contractor on this form. Specifically, there are four entries for the Prime Contractor. Is this supposed to show the headquarters plus satellite offices? Perhaps this is supposed to list the locations of the assigned key staff? We recommend that the Prime Contractor form show locations of key staff (i.e., if a prime contractor intends to assign a key staff person who resides in another state, it would seem to be material to the “Location” criteria, yes?)

ANSWER 11: The form should be included in its entirety. The firm should indicate any location work would be performed.

QUESTION 12: Sec 2, II. Task 2.c. We understand that the County will provide software to initiate the project. Who is providing the hardware (i.e., smartphone or tablets)? Also, we understand that the consultant may opt to use its own software at some point. Please clarify: will the County-provided software be available to the consultant for the duration of the project or will the consultant be required to come up with another software solution at some point in the project?

ANSWER 12: See answer to addendum 1, item 3.

QUESTION 13: Sec 2. III. A.6. Would the County consider extending the ramp up to 8 personnel from 30 to 60 days?

ANSWER 13: No. The County will not consider extending the ramp up to 8 personnel from 30 to 60 days.

QUESTION 14: Proposers must submit signed Letter of Intent with their Proposal for all current Orange County certified M/WBE subcontractors identified on the SCHEDULE OF SUBCONTRACTING - M/WBE PARTICIPATION FORM. These Letters of Intent must indicate the scope of work to be performed by every M/WBE plus the percentage of the overall contract fees to be contracted to the listed subcontractor.

ANSWER 14: Yes.

B. ACKNOWLEDGEMENT OF ADDENDA

- a. The bidder shall acknowledge receipt of this addendum by completing that applicable section in the solicitation or by completion of the acknowledgement information on the addendum. Either form of acknowledgement must be completed and returned no later than the date and time for receipt of the bid.
- b. All other terms and conditions of the RFP remain the same.
- c. Receipt acknowledge by:

Authorized Signature

Date

Title

Name of Firm

Recycling Improvement Pilot Study

August 31, 2018

Background

- From June 28, 2018 to August 16, 2018, Orange County Solid Waste staff conducted a recycling improvement pilot study (Pilot). During the Pilot, 643 recycling carts were observed and tagged to reduce contamination in single-family residential recycling carts.
- The goals of the Pilot were:
 - Test effectiveness of direct feedback via cart tags and non-collection over multiple visits to the same household (HH).
 - Assess level of effort required to tag carts providing input for developing a countywide program.
 - Assess how feedback messaging impacted the quality of recyclables collected.
 - Assess the impact cart tagging has on the participation rate and weekly set out rate.
 - Measure reduction in contamination of material set-out for collection based on acceptance of recycling loads.
 - Test media strategy and gauge response.

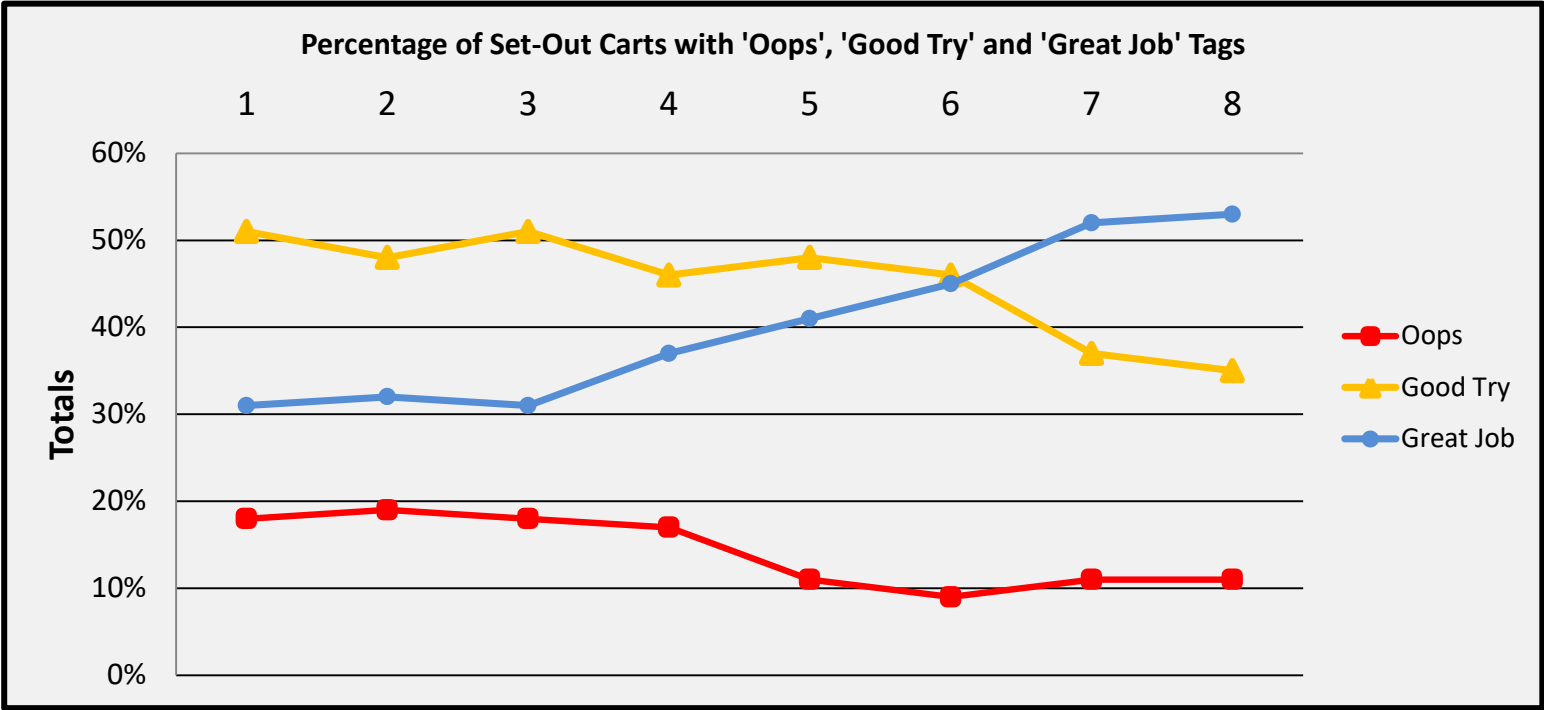
Primary Findings

- Of the 2,965 set-outs recorded, 421 resulted in an ‘Oops’ tag, 1,342 resulted in a ‘Good Try’ tag and 1,190 resulted in a ‘Great Job’ tag. The trend over eight weeks was an increase in ‘Great Job’ tags, and a slight decrease in ‘Good Try’ and ‘Oops.’ *See Figure 1.*
- Eight HH had their carts turned around for non-collection at least once after receiving five or more ‘Oops’ tags. Of those eight HH, three had their cart turned around more than once. Meaning some residents appeared to make absolutely no attempt to recycle properly.
- During two out of the eight weeks, the load was accepted (weeks 4 & 5). While the number of ‘Great Job’ tags increased, several factors contributed to rejection:
 - A single piece of HHW is cause for rejection.
 - Lower volume in ‘Great Job’ carts and higher volume in contaminated carts.
 - The largest numbers of tags issued were ‘Good Try’. Such tags were issued when the carts were contaminated by less than half of the material. Many residents accepted this tag to mean recycling was “good enough,” but the accumulated contaminants caused loads to be rejected.
 - The most common contaminants observed by far were plastic bags, film, and wrap. Following behind was Styrofoam and “Yuck” items such as food, liquids, and dirt. *See Figure 2.*
- Approximately 61 percent of HH placed recyclables out for collection each week.
- Over the eight week Pilot, 96 percent of HH set out their recycling cart at least once.
 - Positive customer feedback was received from many customers that interacted with field crews.

Recommendations

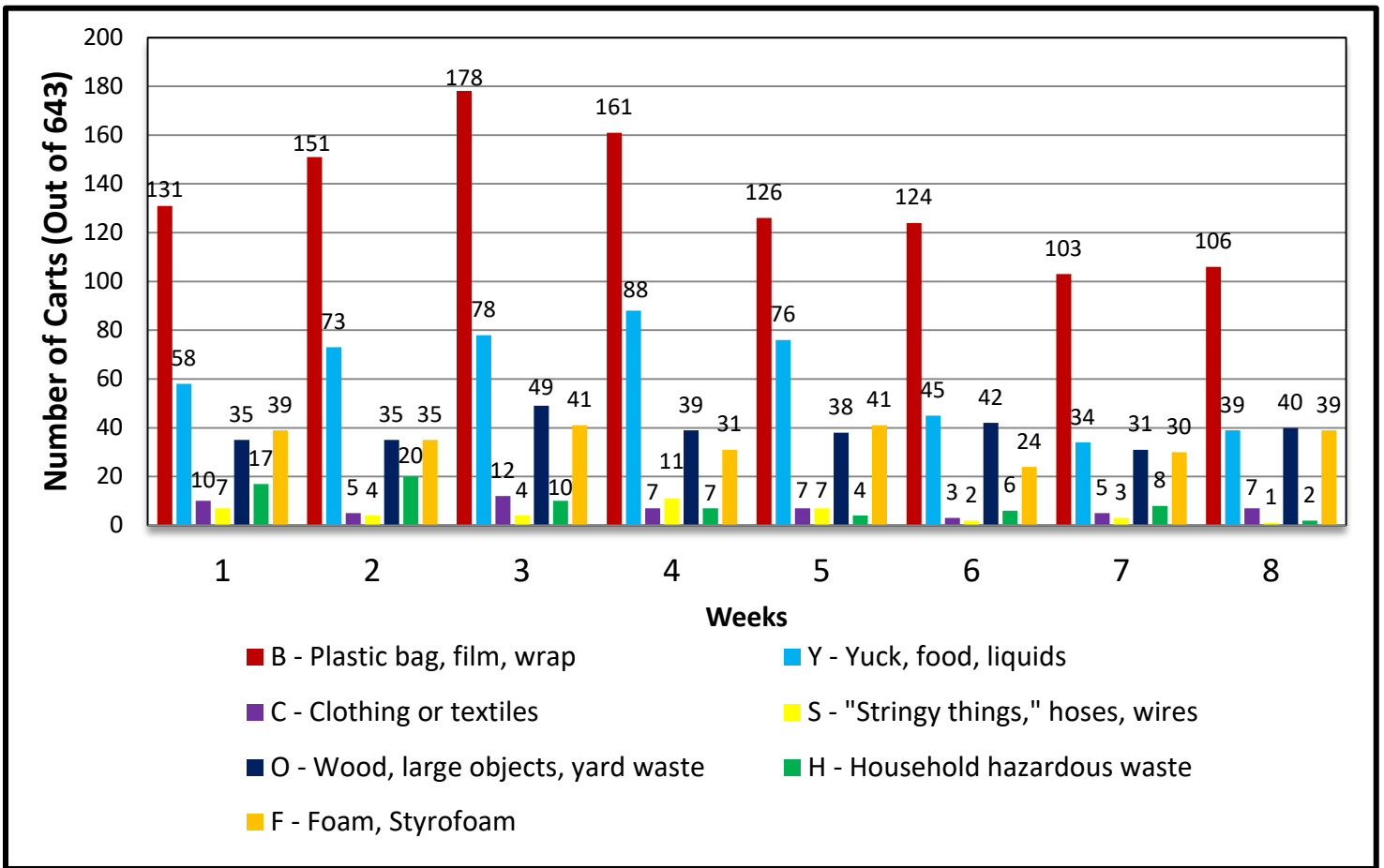
- Eliminate ‘Good Try’ tag and use only two: ‘Great Job’ and ‘Oops.’ Good Try tags appear to confuse customers. Allowing moderate amounts of contamination resulted in loads being rejected.
- Stop collecting contaminated carts on the third ‘Oops’ tag, instead of the fifth. Additional Oops tags did not result in residents reducing the contamination placed in carts.
- Adjust contamination standard for placing an ‘Oops’ tag at greater than 15 percent contamination., and a ‘Great Job’ tag at less than 15 percent contamination.
- In the pilot area, five inspectors were needed to tag 643 homes in less than 4.5 hours. To stay ahead of the truck, inspectors needed to start around 6 a.m. and finish by noon.
- Paper tracking documents proved cumbersome, and mobile technologies are available that should improve field data collection.
- Remove carts at addresses that continue to recycle improperly.
- If household hazardous waste (HHW) is observed in any cart, the cart should be automatically tagged and turned around for non-collection because any amount of HHW will cause a load to be rejected.
- If any amount of plastics bags, film, or wrap are observed by cart inspectors, the cart should automatically receive an ‘Oops’ tag because they are the most common and problematic contaminants.

Figure 1 Tag Trends



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Addresses Tagged out of 643	477	643	633	643	638	643	596	616
Not Set Out	159	284	217	239	256	259	256	254
Great Job Tag	100	116	128	151	156	172	176	191
Good Try Tag	161	173	212	185	183	177	126	125
Oops Tag	57	70	76	68	42	32	36	40
Carts Turned Around	N/A	N/A	N/A	N/A	1	3	2	6

Figure 2 Contamination Trends



Total Carts with Specified Contamination

Contaminants	W1	W2	W3	W4	W5	W6	W7	W8
B - Plastic bag, film, wrap	131	151	178	161	126	124	103	106
Y - Yuck, food, liquids, dirt	58	73	78	88	76	45	34	39
C - Clothing or textiles	10	5	12	7	7	3	5	7
S - "Stringy things," hoses, wires	7	4	4	11	7	2	3	1
O - Wood, large objects, yard waste	35	35	49	39	38	42	31	40
H - Household hazardous waste	17	20	10	7	4	6	8	2
F - Foam, Styrofoam	39	35	41	31	41	24	30	39
Total:	297	323	372	344	299	246	214	234

ORANGE COUNTY RESIDENTIAL RECYCLING COMPOSITION STUDY

Orange County Utilities
Solid Waste Division
5901 Young Pine Road
Orlando, FL
Contract #Y13-902

SCS ENGINEERS

hsagolden
engineering environmental solutions

09213200.37 | March 4, 2019

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1 EXECUTIVE SUMMARY

Orange County Utilities Solid Waste Division retained SCS/HSA Golden Joint Venture (SCS/HSA) under Contract #Y13-902 to perform a recycling composition study for Orange County, Florida (County). As part of this project, SCS/HSA identified material categories for sorting, developed a methodology for sampling and sorting of materials and conducted a five-day sampling event at the two County recycling collection facilities. The following report provides a review of the sorting activities, summarizes the recyclable sampling data, and includes a statistical analysis and a composition profile for each County Collection Zone.

FIELD SORTING EVENTS

From November 12-16 2018, SCS/HSA obtained and manually sorted fifty samples from the County's curbside recycling program. Materials from County Collection Zones 3, 4, and 5 were sampled and sorted at the County's Recovered Materials Processing Facility (RMPF) at the Orange County Solid Waste Management Facility. Materials from County Collection Zones 1 and 2 were sampled and sorted at the McCormick Transfer Station (Transfer Station) in Apopka.

An SCS/HSA's Sampling Manager supervised a sorting crew of four to six people at the two facilities. He coordinated with the tipping floor attendants and heavy equipment operators to obtain samples from selected trucks. The volume of each sample amounted to what could fit in about three 96-gallon refuse carts. The crew manually sorted into 26 different material categories and then recorded each material category's weight. Information on each sample, including the hauler, collection zone, day/time of the sample, and if the load was accepted/rejected, was also recorded.



Sorting Recyclable Materials at the RMPF

STUDY RESULTS

Figure 1 provides a summary of the overall recycling stream. 62.1 percent of the materials collected during the recycling composition study were program-accepted material and 37.9 percent were non-program materials. Paper comprised the largest portion of the program-accepted recyclable material stream at 43.3 percent, followed by plastic at 9.5 percent, and glass at 5.8 percent. For the non-program material portion, 13.1 percent were fines, followed by 7.6 percent non-program plastic items (bags, film, polystyrene, etc.), and 7.0 percent other miscellaneous non-program items.

Figure 1. Overall Residential Recycling Composition

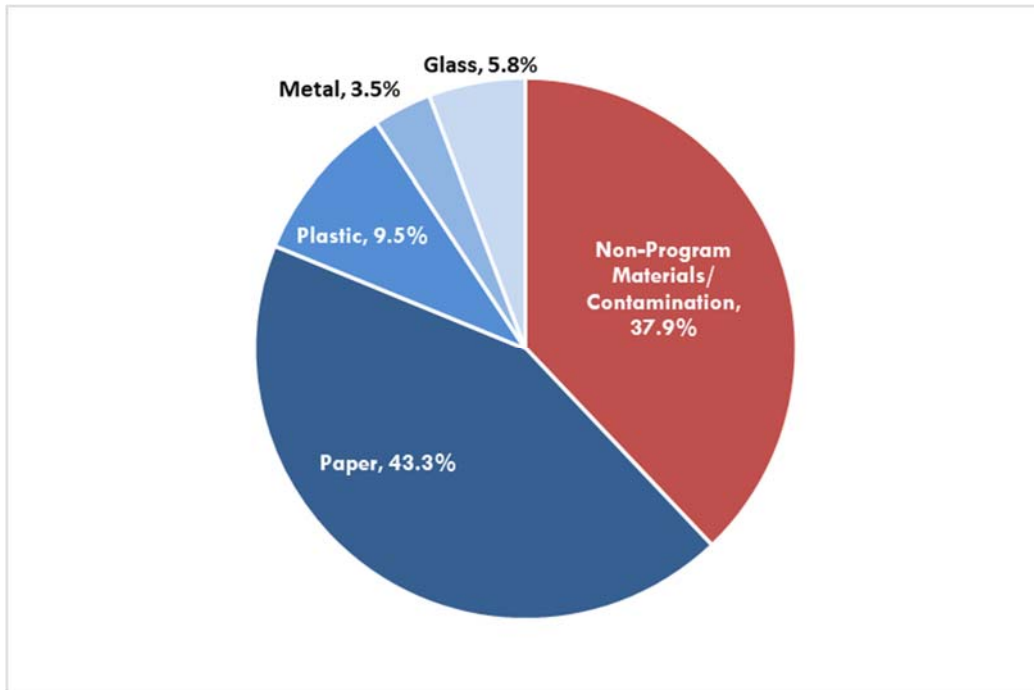


Table 1 provides a detailed profile of the overall residential recycling stream composition for the 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the mean compositions for individual material components in a particular category (i.e. paper, plastic, metal, etc.) equals the percentage shown for that category.

Table 1. Overall Residential Recycling Composition – Detailed

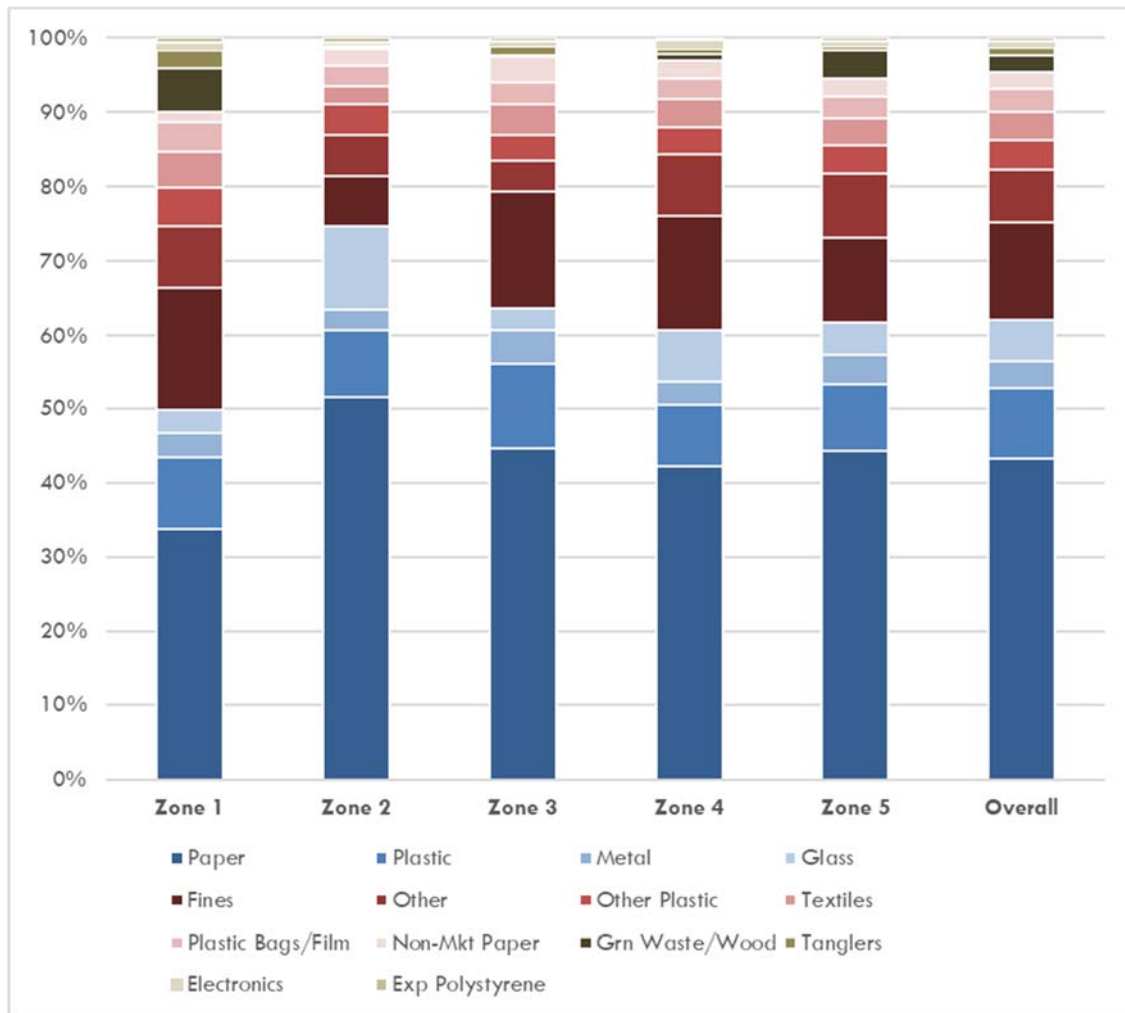
Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	62.1%			
PAPER				
Corrugated Cardboard/Paper Bags	17.8%	9.3%	15.6%	19.9%
Paperboard/Chipboard/Pasteboard	7.3%	3.2%	6.5%	8.0%
Newspaper	6.3%	3.8%	5.4%	7.2%
Office Paper/Junk Mail	5.7%	5.0%	4.5%	6.9%
Magazines/Catalogs	5.3%	4.0%	4.4%	6.2%
Polycoated/Aseptic Containers	0.5%	0.4%	0.4%	0.6%
Phone Books	<0.1%	0.3%	<0.1%	0.1%
Food Service Packaging	0.4%	0.5%	0.3%	0.5%
Total Paper	43.3%	13.7%	40.1%	46.5%
PLASTIC				
#1 PET Bottles (with neck)	4.6%	1.4%	4.3%	4.9%
#1 PET Containers/Tubs (no neck)	0.3%	0.7%	0.1%	0.4%
#2 HDPE Bottles (with neck)	2.5%	0.9%	2.3%	2.7%
#2 HDPE Containers/Tubs (no neck)	0.4%	0.7%	0.3%	0.6%
#3-#7 Bottles and Containers (neck/no neck)	1.7%	0.9%	1.5%	1.9%
Total Plastic	9.5%	2.2%	9.0%	10.0%
METAL				
Aluminum Containers	1.2%	0.6%	1.1%	1.4%
Ferrous and Non-Aluminum Metal Containers	2.0%	1.3%	1.7%	2.3%
Aerosol Cans	0.3%	0.3%	0.2%	0.3%
Total Metal	3.5%	1.4%	3.2%	3.8%
GLASS				
Glass Containers (clear, brown, green)	5.8%	6.3%	4.3%	7.2%
Total Glass	5.8%	6.3%	4.3%	7.2%
NON-PROGRAM MATERIALS	37.9%			
PLASTIC				
Plastic - Bags/Film	3.1%	2.1%	2.6%	3.5%
Plastic - Expanded Polystyrene	0.5%	0.5%	0.4%	0.7%
Plastic - Other (bulky, toys)	4.0%	2.3%	3.4%	4.5%
Total Plastic Contamination	7.6%	3.8%	6.7%	8.5%
OTHER				
Paper - Non-Marketable (coated, soiled)	2.3%	2.0%	1.9%	2.8%
Textiles/Clothing	3.8%	4.5%	2.7%	4.8%
Electronics	0.8%	1.4%	0.5%	1.1%
Green Waste/Wood	2.3%	7.8%	0.5%	4.1%
Tanglers (hoses, cables, wires, cords)	1.0%	1.9%	0.5%	1.5%
Fines (materials <2 inches in diameter)	13.1%	10.0%	10.8%	15.4%
Other Non-Program Items	7.0%	5.4%	5.7%	8.2%
Total Other Contamination	30.3%	15.0%	26.8%	33.8%
	100.0%			

Note: Composition based on 50 samples

A comparison of each zone's recycling composition is shown graphically in **Figure 2**. Blue shaded portions correspond to program-accepted materials. The red and green shades correspond to the non-program materials. The following describes these compositions in relation to one another:

- **Zone 1** – 49.8 percent of materials collected in Zone 1 during the study were non-program materials. This made the Zone 1 recycling stream the most contaminated zone.
- **Zone 2** – This Zone's recycling stream was the cleanest. 74.7 percent of the materials sampled from Zone 2 were program-accepted materials. The remaining 25.3 percent were non-program materials.
- **Zones 3 through 5** – A comparison of the recycling streams in Zones 3 through 5 indicate the samples were not as contaminated as Zone 1 but not as clean as Zone 2. Overall, approximately 60 percent of the samples were program-accepted materials.

Figure 2. Comparison of Recycling Composition by Zone



2 METHODS

GENERATING SECTORS

A goal of this study was to compare each collection zone's recycling streams. The County contracts with a hauler for the exclusive collection of recyclables for each of the five collection zones. **Table 2** lists the currently contracted haulers.

Table 2. Collection Zones and Franchised Haulers

Collection Zone	Hauler
Zone 1	Advanced Disposal Services
Zone 2	Waste Pro of Florida
Zone 3	Advanced Disposal Services
Zone 4	FCC SA
Zone 5	FCC SA

MATERIAL CATEGORIES

The County requested input from SCS/HSA, Waste Management Inc. of Florida (Waste Management), contracted haulers, and other entities to identify the program and non-program material categories and components to measure as part of this study. **Table 3** summarizes the material components measured as part of this study.

Table 3. Material Categories and Components

Program Accepted Materials	Paper	Corrugated Cardboard/Paper Bags
		Paperboard/Chipboard/Pasteboard
		Newspaper
		Office Paper/Junk Mail
		Magazines/Catalogs
		Polycoated/Aseptic Cartons
		Phone Books
		Food Service Packaging
	Plastic	#1 PET Bottles (with neck)
		#1 PET Containers and Tubs (no neck)
		#2 HDPE Bottles (with neck)
		#2 HDPE Containers and Tubs (no neck)
		#3-#7 Bottles and Containers (with or without neck)
Metal	Aluminum Containers	
	Ferrous and Non-Aluminum Containers	
	Aerosol Cans	
Glass	Glass Containers (clear, brown, green)	
Non-Program Materials/ Contamination	Plastic	Plastic - Bags/Film
		Plastic - Expanded Polystyrene
		Plastic - Other (bulky, toys, containers with liquid/food)
	Other	Paper - Non-Marketable (composite, soiled, coated)
		Textiles/Clothing
		Electronics
		Green Waste/Wood
		Tanglers (hoses, cords, wire hangers, cables, Christmas lights)
		Fines (materials less than 2 inches in diameter)
		Other Non-Program Items (tires, construction/demolition material, dirt, diapers, ceramics, etc.)

HOST FACILITIES

The County curbside collection program sends its recyclable materials to two facilities for out-of-County processing: the Recovered Materials Processing Facility (RMPF) on Young Pine Road in Orlando and the McCormick Transfer Station (Transfer Station) in Apopka. These facilities are owned by the County and operated by Waste Management under County Contract No. Y3-1021. This composition study was conducted at both facilities.

MATERIAL QUANTITIES AND SAMPLING PLAN

The County provided SCS/HSA with the quantity of recyclable materials collected each residential collection zone for 2017. Since the County collects similar amounts from each zone, ten samples from each zone were obtained and sorted. Only one sample of recyclable materials was obtained from a haul truck. **Table 4** summarizes the sampling plan for this study.

Table 4. Sampling Plan by Collection Zone

Collection Zone	Annual Quantity, Tons (2017)	Percent of Total Recyclable Materials Collected	Number of Samples During Study
Zone 1	11,614	18.7%	10
Zone 2	13,231	21.3%	10
Zone 3	12,535	20.2%	10
Zone 4	12,596	20.3%	10
Zone 5	12,220	19.6%	10
TOTAL	62,196	100%	50

FIELDWORK SCHEDULE

SCS/HSA performed sampling and sorting activities on November 12-16, 2018 (Monday – Friday). This week represented a typical week for the County’s collection program and avoided special events, activities, or holidays which could affect the stream composition. On Monday, Tuesday, and Wednesday, the SCS/HSA sampled and sorted recyclable materials delivered to the RMPF from Zones 3, 4, and 5. On Thursday and Friday, the team sampled and sorted recyclable materials from Zones 1 and 2 at the Transfer Station.

FIELDWORK COLLECTION METHODS

This section details the methods used by SCS/HSA to sample and sort recyclable materials at both the RMPF and Transfer Station. The procedures described in this section were repeated each day of fieldwork for each sample obtained.

Equipment

Samples were sorted by hand and classified by material category and component according to the agreed-upon material list (**Table 3**). The major equipment used to complete this study included:

- **Sort Table:** The sort table consisted of two tables that were six feet long and two feet wide. The tables were placed adjacent to each other to form a larger six-foot by four-foot sorting surface. Tables were impermeable and capable of supporting 150 pounds.
- **Containers:** 30 containers were used to sort the materials in the recycling stream. Four different types of containers were used ranging in size from 18- to 30-gallons. Each container was weighed at the start of the project and the tare weight for each container was recorded. A unique identifier for each container type was assigned and recorded that allowed SCS/HSA to subtract the tare weight of the container from the sorted material components during the data analysis phase.
- **Wheeled-Refuse/Recycling Carts:** The County and Waste Management provided the project team with 20 to 25 wheeled 96-gallon carts to obtain samples and place program-accepted and non-program accepted materials once they were sorted and their weight had been recorded. Program-accepted materials were placed in separate carts than non-program accepted materials.

- **Scale:** Factory-calibrated portable bench scales were used to weigh sorted materials. The scales recorded weight to the nearest 0.02 pound and had a capacity of 150 pounds.
- **Personnel Protective Equipment (PPE):** Field staff were required to wear steel/composite toe shoes or boots that cover the ankle, safety glasses, reflective safety vests, and puncture resistant gloves at all times when conducting fieldwork. Each project team member supplied their own steel-toe boots/shoes and Waste Management provided the remaining PPE. **Appendix A** contains the SCS/HSA Site Specific Health and Safety Plan for this study.
- **Shovel and Push Broom:** Used to facilitate housekeeping and maintain a safe work area.
- **Data Forms:** SCS/HSA created a separate data collection form for each sample of recyclable materials sorted during the study. The form contained fields to record information on each sample, including the generating sector and hauler information. This form was also used to record material weights.

Sample Selection and Acquisition

SCS/HSA employed a number of procedures and quality control measures to confirm that the samples obtained for sorting were representative of the County's typical recyclable material streams.

The SCS/HSA designated Sampling Manager oversaw selection and collection of each sample. This individual utilized the sampling plan to identify which trucks to obtain samples. The Sampling Manager monitored trucks entering each facility, and communicated with the scalehouse and tipping floor attendant to select trucks for sampling. Collection trucks for sampled on a random basis when a vehicle arrived at the RMPF or Transfer Station. The SCS/HSA Sampling Manager identified which zone a truck originated from (based on the decal on each truck's side panel) and selected it for sampling, as appropriate.

The SCS/HSA Sampling Manager used a radio to communicate with the tipping floor attendant that a truck for sampling has arrived. Information on hauler, collection zone, day/time, and truck number was recorded. The tipping floor attendant communicated with the heavy equipment operator to obtain a sample once all materials were offloaded from the truck and the materials had been visually inspected.

The SCS/HSA Sampling Manager used three 96-gallon refuse carts to obtain the sample in the tipping areas of the RMPF and Transfer Station. Using a loader, the operator obtained a sample of materials from an accessible portion of the load and dumped the materials in the designated refuse carts. Once the three refuse carts were completely filled the sample was complete and the full carts



Obtaining a Sample of Recyclable Materials at the McCormick Transfer Station

were transported to the sorting area. Finally, the SCS/HSA Sampling Manager obtained information from the facility inspector on whether the load of materials was accepted for recycling or rejected for disposal.

Manual Sorting

A sorting crew of four to six staff manually sorted material while an SCS/HSA Sorting Manager oversaw sorting, conducted quality-control checks and recorded data. The manual sorting followed a five-step process that is summarized below.



Sorting Recyclable Materials

1. Materials were placed on the sort table.
2. Each sample was hand-sorted until the materials greater than two inches in diameter were in the appropriate material category. The remaining small materials on the table were placed in a separate container and identified as “fines.” Plastic bags used to contain materials (regardless of size) were unopened and placed in a separate container.
3. Upon conclusion of sorting all “loose” sample materials, the number of plastic bags containing materials in the sample were counted. These bags were then torn open and the contents were sorted into the corresponding materials categories.
4. After sorting all materials from each sample, the containers with the sorted materials were brought to a scale for weighing. The SCS/HSA Sorting Manager weighed each container to the nearest 0.02 pound. The net weight and corresponding unique container identifier were recorded on the sample record.
5. After the weight of each container of sorted materials was recorded, materials were placed in recycling carts and non-program materials were placed in separate refuse carts for disposal.

This five-step process was repeated until all the material was characterized. Samples were maintained in as-disposed conditions or as close to this as possible until the actual sorting began.

Data Recording

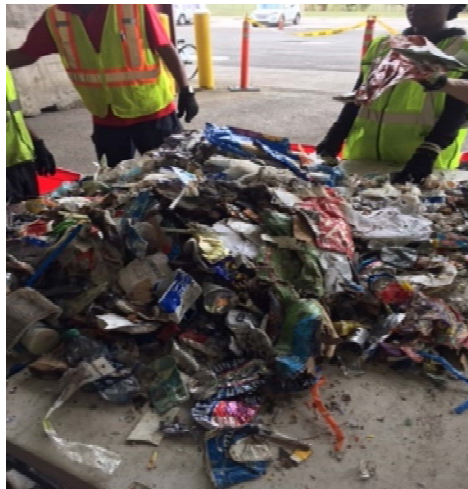
The SCS/HSA field managers were responsible for recording data. Each of the 50 samples analyzed for this study had its own unique data record where all information on the sample was recorded. Collection zone, hauler, accepted/rejected status, day/time of sample, and material weights were recorded. In addition, a separate sample-tracking document was maintained by SCS/HSA field managers to serve as an additional check on the number and source of samples obtained and

sorted. At the end of each day of fieldwork, the SCS/HSA Sorting Manager reviewed the data and matched the individual data sheets to the waste sample-tracking document to confirm accurate and consistent tracking of the data.

STATISTICAL METHODS

SCS/HSA used the American Society of Testing and Materials (ASTM) International Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste (D 5231-92) as a guide to complete this project. However, because unprocessed solid waste differs in consistency and variability from source-separated residential recyclable materials, some variations in this protocol were instituted. Notably, sample sizes were volume-based and not weight-based to reflect the more homogeneous nature of recyclable materials and variability of material weights.

SCS/HSA estimated the mean composition and calculated the standard deviation and 90 percent confidence intervals for each of the 26 material components evaluated for this study by zone and for the overall recycling stream. The mean composition was calculated by dividing the weight of each material component by the total weight of the sample. The mean for each material component by zone was calculated by averaging the means of the same material component from all samples in that zone. The standard deviation, which is a measure of the variability of the mean, was calculated for each material component in each zone. The 90 percent confidence intervals calculation estimates the probability that the same sampling method will provide results within the identified interval 90 percent of the time.



Contaminated Study Sample



Clean Study Sample of Recyclable Materials

3 RESULTS

The following section provides a summary and statistical analysis of the study data. The results are illustrated in the following ways:

- **Pie Chart** – Pie charts are used to show the major categories of the residential recycling stream.

- **Table** – Statistical tables provide the specific composition percentages of each of the 26 material components sorted as part of the study. The tables also include the calculated standard deviations and 90 percent confidence intervals for each material category and component.

OVERALL COMPOSITION

Figure 3 provides a summary of the residential recycling stream in unincorporated Orange County. 62.1 percent of the materials sampled during this study were recorded as program-accepted and 37.9 percent were non-program. Paper comprised the largest portion of the program-accepted materials at 43.3 percent, followed by plastic at 9.5 percent, glass at 5.8 percent, and metal at 3.5 percent. For the non-program materials, 13.1 percent were fines, 7.6 percent were non-program plastic items (bags, film, polystyrene, etc.), and 7.0 percent were other miscellaneous non-program materials.

- Fines were defined as materials two inches in diameter or less. A significant portion of the weight of fines within the study samples was crushed glass. Other materials categorized as fines included paper scraps, food items, bottle caps and other small unidentifiable materials.
- The “other” category consisted of materials that did not fit the definition of any other material component. Common materials identified as “other” include diapers, construction/demolition debris, rocks, carpet, tires, and non-container metal and glass.



Examples of Materials Characterized as Fines (Materials with a Diameter of Two Inches or Less)

Figure 3. Overall Residential Recycling Composition

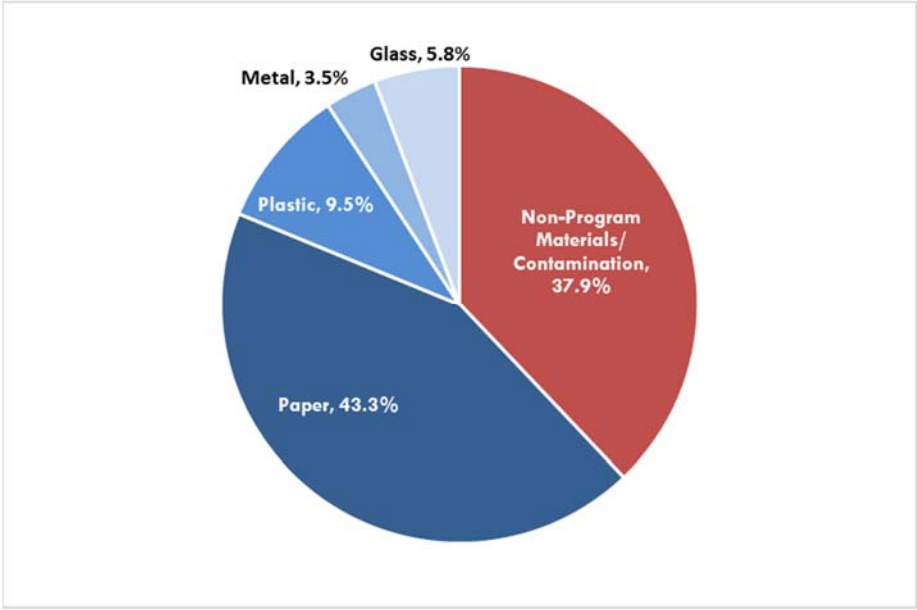


Table 5 provides a detailed profile of the overall residential recycling stream composition for all 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the individual material components for a particular category equals the total percentage shown for that category.

Table 5. Overall Residential Recycling Composition – Detailed

Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	62.1%			
PAPER				
Corrugated Cardboard/Paper Bags	17.8%	9.3%	15.6%	19.9%
Paperboard/Chipboard/Pasteboard	7.3%	3.2%	6.5%	8.0%
Newspaper	6.3%	3.8%	5.4%	7.2%
Office Paper/Junk Mail	5.7%	5.0%	4.5%	6.9%
Magazines/Catalogs	5.3%	4.0%	4.4%	6.2%
Polycoated/Aseptic Containers	0.5%	0.4%	0.4%	0.6%
Phone Books	<0.1%	0.3%	<0.1%	0.1%
Food Service Packaging	0.4%	0.5%	0.3%	0.5%
Total Paper	43.3%	13.7%	40.1%	46.5%
PLASTIC				
#1 PET Bottles (with neck)	4.6%	1.4%	4.3%	4.9%
#1 PET Containers/Tubs (no neck)	0.3%	0.7%	0.1%	0.4%
#2 HDPE Bottles (with neck)	2.5%	0.9%	2.3%	2.7%
#2 HDPE Containers/Tubs (no neck)	0.4%	0.7%	0.3%	0.6%
#3-#7 Bottles and Containers (neck/no neck)	1.7%	0.9%	1.5%	1.9%
Total Plastic	9.5%	2.2%	9.0%	10.0%
METAL				
Aluminum Containers	1.2%	0.6%	1.1%	1.4%
Ferrous and Non-Aluminum Metal Containers	2.0%	1.3%	1.7%	2.3%
Aerosol Cans	0.3%	0.3%	0.2%	0.3%
Total Metal	3.5%	1.4%	3.2%	3.8%
GLASS				
Glass Containers (clear, brown, green)	5.8%	6.3%	4.3%	7.2%
Total Glass	5.8%	6.3%	4.3%	7.2%
NON-PROGRAM MATERIALS	37.9%			
PLASTIC				
Plastic - Bags/Film	3.1%	2.1%	2.6%	3.5%
Plastic - Expanded Polystyrene	0.5%	0.5%	0.4%	0.7%
Plastic - Other (bulky, toys)	4.0%	2.3%	3.4%	4.5%
Total Plastic Contamination	7.6%	3.8%	6.7%	8.5%
OTHER				
Paper - Non-Marketable (coated, soiled)	2.3%	2.0%	1.9%	2.8%
Textiles/Clothing	3.8%	4.5%	2.7%	4.8%
Electronics	0.8%	1.4%	0.5%	1.1%
Green Waste/Wood	2.3%	7.8%	0.5%	4.1%
Tanglers (hoses, cables, wires, cords)	1.0%	1.9%	0.5%	1.5%
Fines (materials <2 inches in diameter)	13.1%	10.0%	10.8%	15.4%
Other Non-Program Items	7.0%	5.4%	5.7%	8.2%
Total Other Contamination	30.3%	15.0%	26.8%	33.8%
	100.0%			

Note: Composition based on 50 samples

ZONE 1 COMPOSITION

Figure 4 provides a summary of the material categories in the Zone 1 residential recycling stream. 49.8 percent of the materials collected from Zone 1 trucks during the recycling composition study were program-accepted materials and 50.2 percent were non-program. Paper comprised the largest portion of the program-accepted recycling stream at 33.7 percent, followed by plastic at 9.8 percent, metal at 3.2 percent, and glass at 3.1 percent. For the non-program materials, 16.7 percent were fines, followed by non-program plastic items at 9.9%, miscellaneous non-program items at 8.2 percent, and green waste/wood at 5.8 percent.

Figure 4. Zone 1 Residential Recycling Composition

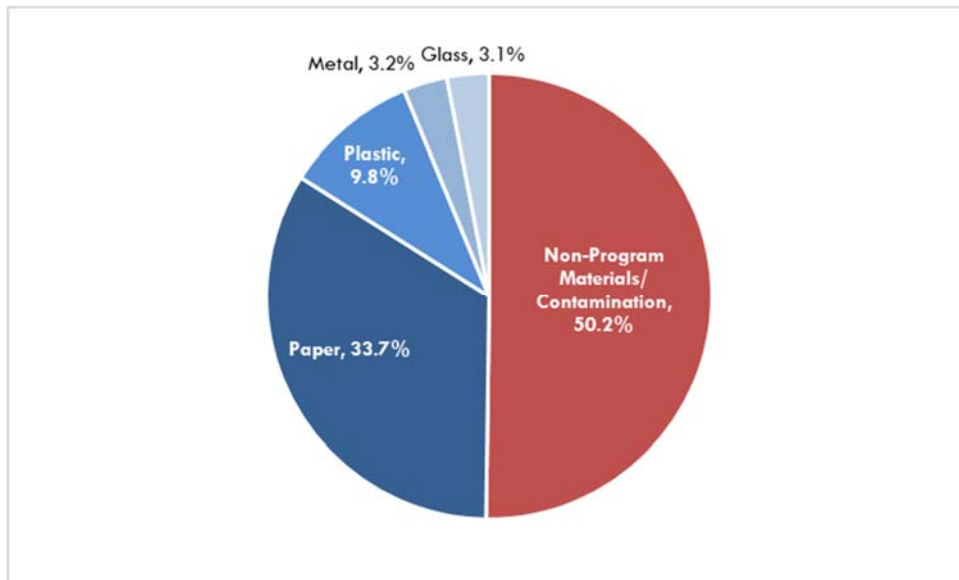


Table 6 provides a detailed profile of the Zone 1 residential recycling stream composition for all 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the individual material components for a particular category equals the percentage shown for that category.

Table 6. Zone 1 Residential Recycling Composition – Detailed

Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	49.8%			
PAPER				
Corrugated Cardboard/Paper Bags	15.1%	5.8%	12.1%	18.1%
Paperboard/Chipboard/Pasteboard	6.4%	3.3%	4.7%	8.1%
Newspaper	4.6%	3.0%	3.0%	6.2%
Office Paper/Junk Mail	4.2%	2.0%	3.1%	5.2%
Magazines/Catalogs	2.7%	2.0%	1.7%	3.7%
Polycoated/Aseptic Containers	0.3%	0.2%	0.2%	0.4%
Phone Books	<0.1%	<0.1%	<0.1%	<0.1%
Food Service Packaging	0.4%	0.4%	0.2%	0.6%
Total Paper	33.7%	8.0%	29.6%	37.9%
PLASTIC				
#1 PET Bottles (with neck)	4.6%	1.4%	3.9%	5.3%
#1 PET Containers/Tubs (no neck)	0.4%	0.4%	0.2%	0.6%
#2 HDPE Bottles (with neck)	2.9%	1.0%	2.4%	3.4%
#2 HDPE Containers/Tubs (no neck)	0.2%	0.3%	0.1%	0.4%
#3-#7 Bottles and Containers (neck/no neck)	1.7%	1.1%	1.1%	2.2%
Total Plastic	9.8%	2.4%	8.5%	11.0%
METAL				
Aluminum Containers	1.1%	0.5%	0.8%	1.4%
Ferrous and Non-Aluminum Metal Containers	1.7%	0.6%	1.4%	2.1%
Aerosol Cans	0.4%	0.2%	0.2%	0.5%
Total Metal	3.2%	1.0%	2.7%	3.7%
GLASS				
Glass Containers (clear, brown, green)	3.1%	2.7%	1.6%	4.5%
Total Glass	3.1%	2.7%	1.6%	4.5%
NON-PROGRAM MATERIALS	50.2%			
PLASTIC				
Plastic - Bags/Film	4.0%	3.0%	2.4%	5.5%
Plastic - Expanded Polystyrene	0.7%	0.4%	0.5%	1.0%
Plastic - Other (bulky, toys)	5.2%	2.6%	3.8%	6.5%
Total Plastic Contamination	9.9%	5.3%	7.1%	12.6%
OTHER				
Paper - Non-Marketable (coated, soiled)	1.3%	0.5%	1.0%	1.5%
Textiles/Clothing	4.9%	3.1%	3.3%	6.5%
Electronics	1.0%	1.3%	0.3%	1.7%
Green Waste/Wood	5.8%	13.4%	<0.1%	12.8%
Tanglers (hoses, cables, wires, cords)	2.5%	2.7%	1.1%	3.9%
Fines (materials <2 inches in diameter)	16.7%	13.8%	9.5%	23.8%
Other Non-Program Items	8.2%	5.5%	5.3%	11.1%
Total Other Contamination	40.4%	12.2%	34.0%	46.7%
	100.0%			

Note: Composition based on 10 samples

ZONE 2 COMPOSITION

Figure 5 provides a summary of the material categories in the Zone 2 residential recycling stream. 74.7 percent of the materials sampled from Zone 2 trucks were program-accepted material and 25.3 percent were non-program materials. Paper comprised the largest portion of the program-accepted recycling stream at 51.6 percent, followed by glass at 11.3 percent, plastic at 9.1 percent, and metal at 2.7 percent. For the non-program materials, non-program plastic items were 7.5 percent, 6.8 percent were fines, and 5.5 percent were miscellaneous non-program materials.

Figure 5. Zone 2 Residential Recycling Composition

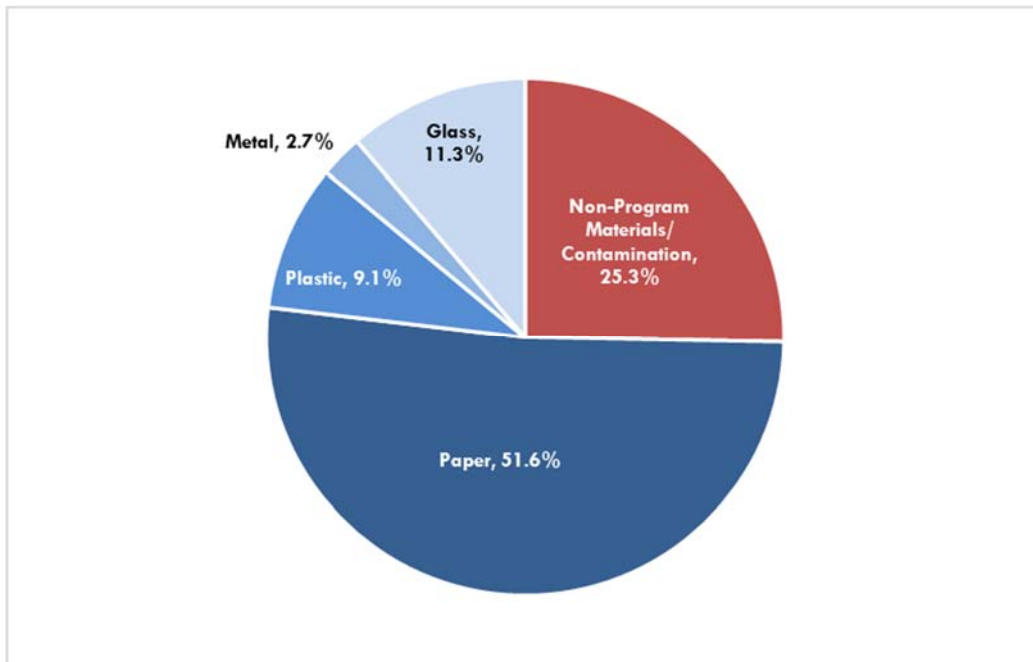


Table 7 provides a detailed profile of the Zone 2 residential recycling stream composition for all 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the individual material components for a particular category equals the percentage shown for that category.

Table 7. Zone 2 Residential Recycling Composition – Detailed

Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	74.7%			
PAPER				
Corrugated Cardboard/Paper Bags	24.9%	10.1%	19.7%	30.2%
Paperboard/Chipboard/Pasteboard	5.0%	1.6%	4.2%	5.9%
Newspaper	5.0%	2.9%	3.5%	6.5%
Office Paper/Junk Mail	7.4%	2.4%	6.1%	8.6%
Magazines/Catalogs	8.3%	5.3%	5.6%	11.1%
Polycoated/Aseptic Containers	0.5%	0.2%	0.4%	0.6%
Phone Books	<0.1%	<0.1%	<0.1%	<0.1%
Food Service Packaging	0.5%	0.4%	0.2%	0.7%
Total Paper	51.6%	12.8%	44.9%	58.3%
PLASTIC				
#1 PET Bottles (with neck)	4.0%	1.1%	3.4%	4.6%
#1 PET Containers/Tubs (no neck)	0.2%	0.2%	0.1%	0.3%
#2 HDPE Bottles (with neck)	2.6%	0.9%	2.1%	3.0%
#2 HDPE Containers/Tubs (no neck)	0.3%	0.5%	<0.1%	0.6%
#3-#7 Bottles and Containers (neck/no neck)	2.0%	0.4%	1.8%	2.2%
Total Plastic	9.1%	1.9%	8.2%	10.1%
METAL				
Aluminum Containers	1.1%	0.5%	0.8%	1.3%
Ferrous and Non-Aluminum Metal Containers	1.3%	0.5%	1.1%	1.5%
Aerosol Cans	0.3%	0.4%	0.1%	0.5%
Total Metal	2.7%	0.7%	2.3%	3.1%
GLASS				
Glass Containers (clear, brown, green)	11.3%	4.8%	8.8%	13.8%
Total Glass	11.3%	4.8%	8.8%	13.8%
NON-PROGRAM MATERIALS				
PLASTIC				
Plastic - Bags/Film	2.7%	1.2%	2.1%	3.4%
Plastic - Expanded Polystyrene	0.7%	0.8%	0.3%	1.1%
Plastic - Other (bulky, toys)	4.1%	2.9%	2.6%	5.6%
Total Plastic Contamination	7.5%	3.6%	5.7%	9.4%
OTHER				
Paper - Non-Marketable (coated, soiled)	2.3%	1.8%	1.4%	3.2%
Textiles/Clothing	2.4%	4.5%	<0.1%	4.7%
Electronics	0.3%	0.5%	0.1%	0.6%
Green Waste/Wood	0.2%	0.3%	<0.1%	0.4%
Tanglers (hoses, cables, wires, cords)	0.3%	0.7%	<0.1%	0.6%
Fines (materials <2 inches in diameter)	6.8%	6.2%	3.5%	10.0%
Other Non-Program Items	5.5%	3.2%	3.9%	7.1%
Total Other Contamination	17.8%	12.4%	11.3%	24.2%
	100.0%			

Note: Composition based on 10 samples

ZONE 3 COMPOSITION

Figure 6 provides a summary of the material categories in the Zone 3 residential recycling stream. 63.5 percent of the material sampled from Zone 3 trucks were program-accepted material and 36.5 percent were non-program materials. Paper comprised the largest portion of the program-accepted recycling stream at 44.6 percent, followed by plastic at 11.3 percent, and metal at 4.6 percent. For the non-program materials, 15.4 percent were fines, 6.7 were non-program plastic items, 4.2 percent were miscellaneous non-program materials, and 4.1 percent were textiles/clothing.

Figure 6. Zone 3 Residential Recycling Composition

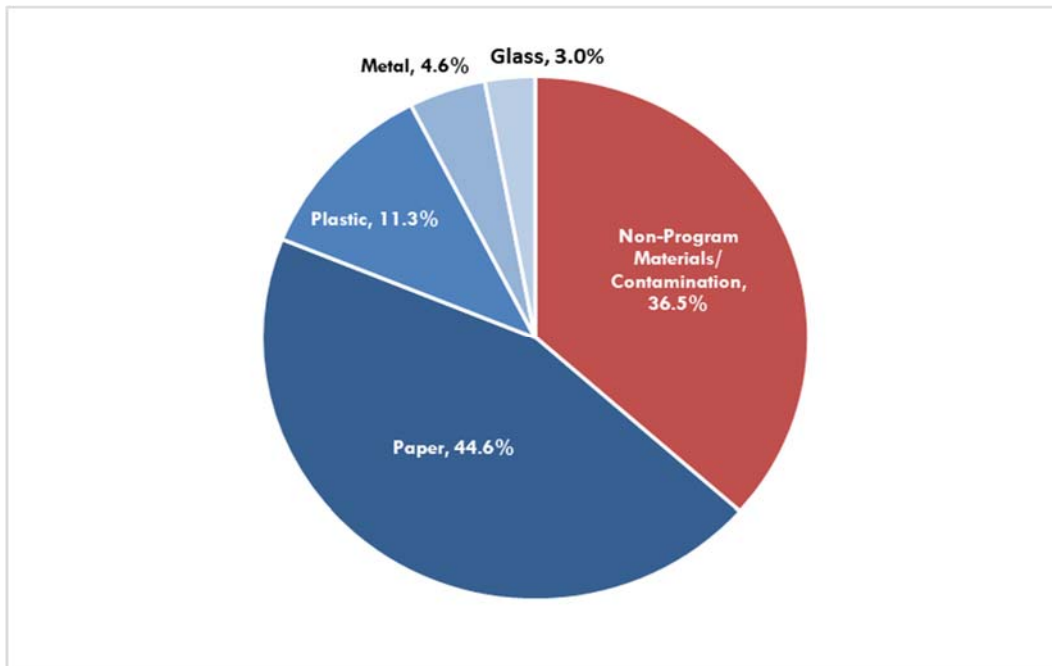


Table 8 provides a detailed profile of the Zone 3 residential recycling composition for all 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the individual material components for a particular category equals the percentage shown for that category.

Table 8. Zone 3 Residential Recycling Composition – Detailed

Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	63.5%			
PAPER				
Corrugated Cardboard/Paper Bags	19.0%	12.0%	12.7%	25.2%
Paperboard/Chipboard/Pasteboard	8.6%	4.6%	6.2%	11.0%
Newspaper	5.6%	3.5%	3.8%	7.4%
Office Paper/Junk Mail	4.9%	5.2%	2.2%	7.6%
Magazines/Catalogs	5.2%	4.1%	3.1%	7.4%
Polycoated/Aseptic Containers	0.7%	0.8%	0.3%	1.1%
Phone Books	0.2%	0.3%	<0.1%	0.3%
Food Service Packaging	0.5%	0.9%	<0.1%	1.0%
Total Paper	44.6%	17.3%	35.7%	53.6%
PLASTIC				
#1 PET Bottles (with neck)	6.0%	1.1%	5.5%	6.6%
#1 PET Containers/Tubs (no neck)	<0.1%	0.1%	<0.1%	0.1%
#2 HDPE Bottles (with neck)	2.3%	1.2%	1.7%	2.9%
#2 HDPE Containers/Tubs (no neck)	0.8%	1.4%	0.1%	1.6%
#3-#7 Bottles and Containers (neck/no neck)	2.1%	1.1%	1.5%	2.6%
Total Plastic	11.3%	2.1%	10.2%	12.4%
METAL				
Aluminum Containers	1.4%	0.8%	1.0%	1.8%
Ferrous and Non-Aluminum Metal Containers	3.1%	2.1%	2.0%	4.2%
Aerosol Cans	<0.1%	0.1%	<0.1%	<0.1%
Total Metal	4.6%	2.0%	3.5%	5.6%
GLASS				
Glass Containers (clear, brown, green)	3.0%	3.6%	1.1%	4.8%
Total Glass	3.0%	3.6%	1.1%	4.8%
NON-PROGRAM MATERIALS	36.5%			
PLASTIC				
Plastic - Bags/Film	2.8%	1.3%	2.1%	3.5%
Plastic - Expanded Polystyrene	0.5%	0.3%	0.3%	0.6%
Plastic - Other (bulky, toys)	3.4%	1.7%	2.5%	4.3%
Total Plastic Contamination	6.7%	2.0%	5.7%	7.7%
OTHER				
Paper - Non-Marketable (coated, soiled)	3.4%	2.6%	2.1%	4.8%
Textiles/Clothing	4.1%	6.3%	0.9%	7.4%
Electronics	0.8%	1.5%	<0.1%	1.5%
Green Waste/Wood	0.9%	1.2%	0.3%	1.5%
Tanglers (hoses, cables, wires, cords)	1.1%	2.5%	<0.1%	2.4%
Fines (materials <2 inches in diameter)	15.4%	9.5%	10.5%	20.3%
Other Non-Program Items	4.2%	2.9%	2.7%	5.7%
Total Other Contamination	29.8%	15.2%	21.9%	37.8%
	100.0%			

Note: Composition based on 10 samples

ZONE 4 COMPOSITION

Figure 7 provides a summary of the material categories in the Zone 4 residential recycling stream. 60.7 percent of the materials sampled from Zone 4 trucks were program-accepted material and 39.3 percent were non-program materials. Paper comprised the largest portion of the program-accepted recycling stream at 42.2 percent, followed by plastic at 8.2 percent, and glass at 7.1 percent. For the non-program materials, 15.4 percent were fines, 8.3 percent were miscellaneous non-program items, and 6.7 percent were non-program plastic items.

Figure 7. Zone 4 Residential Recycling Composition

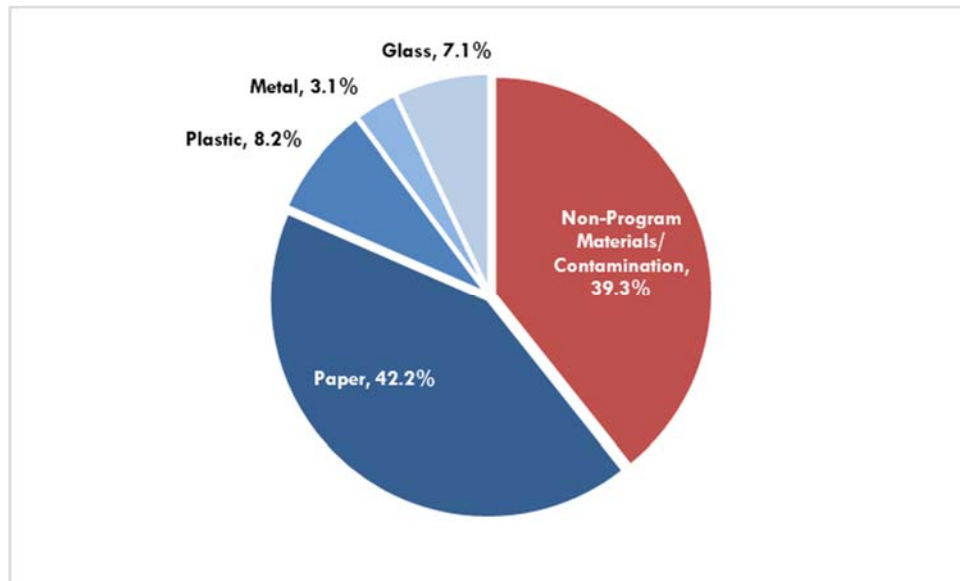


Table 9 provides a detailed profile of the Zone 4 residential recycling stream composition for all 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the individual material components for a particular category equals the percentage shown for that category.

Table 9. Zone 4 Residential Recycling Composition – Detailed

Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	60.7%			
PAPER				
Corrugated Cardboard/Paper Bags	15.2%	6.2%	11.9%	18.4%
Paperboard/Chipboard/Pasteboard	7.6%	2.2%	6.5%	8.8%
Newspaper	7.7%	3.5%	5.9%	9.5%
Office Paper/Junk Mail	5.4%	5.6%	2.4%	8.3%
Magazines/Catalogs	5.5%	2.8%	4.0%	6.9%
Polycoated/Aseptic Containers	0.5%	0.3%	0.3%	0.7%
Phone Books	<0.1%	0.2%	<0.1%	0.2%
Food Service Packaging	0.3%	0.5%	<0.1%	0.6%
Total Paper	42.2%	12.2%	35.9%	48.6%
PLASTIC				
#1 PET Bottles (with neck)	3.7%	1.4%	3.0%	4.4%
#1 PET Containers/Tubs (no neck)	0.6%	1.6%	<0.1%	1.4%
#2 HDPE Bottles (with neck)	2.3%	0.7%	1.9%	2.7%
#2 HDPE Containers/Tubs (no neck)	0.4%	0.4%	0.2%	0.6%
#3-#7 Bottles and Containers (neck/no neck)	1.2%	0.9%	0.8%	1.7%
Total Plastic	8.2%	1.7%	7.4%	9.1%
METAL				
Aluminum Containers	1.3%	0.5%	1.0%	1.5%
Ferrous and Non-Aluminum Metal Containers	1.6%	0.6%	1.3%	1.8%
Aerosol Cans	0.3%	0.2%	0.2%	0.4%
Total Metal	3.1%	0.7%	2.8%	3.5%
GLASS				
Glass Containers (clear, brown, green)	7.1%	9.5%	2.1%	12.0%
Total Glass	7.1%	9.5%	2.1%	12.0%
NON-PROGRAM MATERIALS	39.3%			
PLASTIC				
Plastic - Bags/Film	2.8%	2.1%	1.7%	3.9%
Plastic - Expanded Polystyrene	0.3%	0.2%	0.2%	0.4%
Plastic - Other (bulky, toys)	3.6%	2.3%	2.4%	4.7%
Total Plastic Contamination	6.7%	3.1%	5.0%	8.3%
OTHER				
Paper - Non-Marketable (coated, soiled)	2.4%	2.5%	1.1%	3.7%
Textiles/Clothing	3.8%	4.5%	1.5%	6.2%
Electronics	1.2%	2.0%	0.2%	2.3%
Green Waste/Wood	0.8%	2.1%	<0.1%	1.9%
Tanglers (hoses, cables, wires, cords)	0.7%	1.5%	<0.1%	1.5%
Fines (materials <2 inches in diameter)	15.4%	10.5%	9.9%	20.9%
Other Non-Program Items	8.3%	5.1%	5.7%	10.9%
Total Other Contamination	32.7%	15.1%	24.8%	40.5%
	100.0%			

Note: Composition based on 10 samples

ZONE 5 COMPOSITION

Figure 8 provides a summary of the material categories in the Zone 5 residential recycling stream. 61.8 percent of the materials sampled from Zone 5 trucks were program-accepted material and 38.2 percent were non-program materials. Paper comprised the largest portion of the program-accepted recycling stream at 44.3 percent, followed by plastic at 9.0 percent, and glass at 4.5 percent. For the non-program material portion, 11.4 percent were fines, 8.7 percent were miscellaneous non-program materials, and 7.2 percent were non-program plastic items.

Figure 8. Zone 5 Residential Recycling Composition

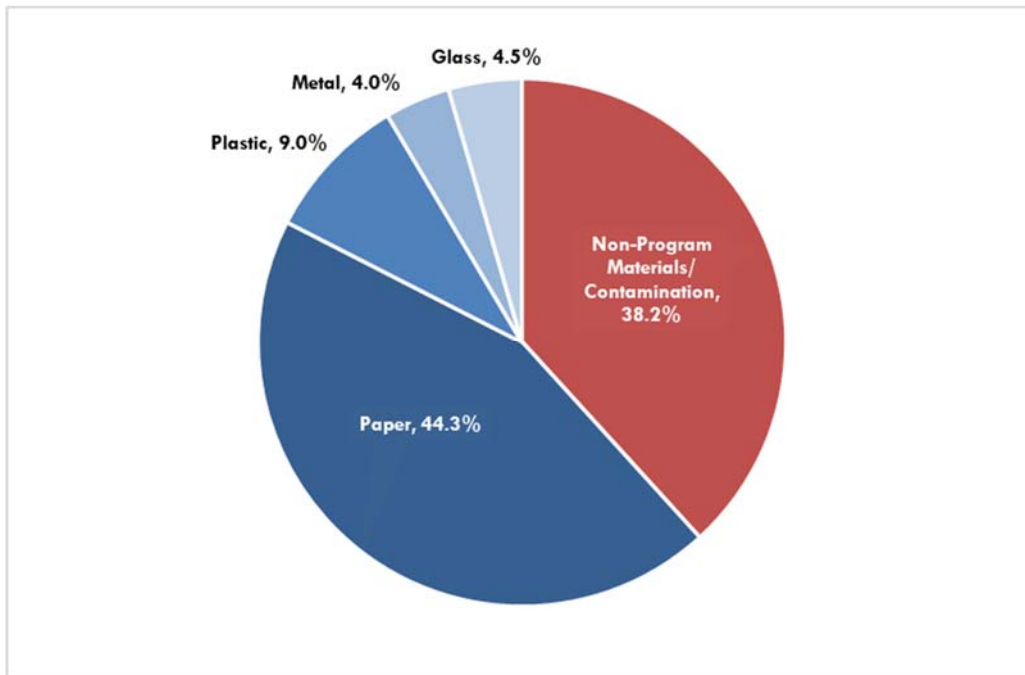


Table 10 provides a detailed profile of the Zone 5 residential recycling stream composition for all 26 material components. For each material component, the mean, standard deviation, and 90 percent confidence intervals are included. The sum of the individual material components for a particular category equals the percentage shown for that category.

Table 10. Zone 5 Residential Recycling Composition – Detailed

Material Components	Mean Composition	Standard Deviation	90% Confidence Limits	
			Lower	Upper
PROGRAM ACCEPTED MATERIALS	61.8%			
PAPER				
Corrugated Cardboard/Paper Bags	14.7%	8.5%	10.3%	19.1%
Paperboard/Chipboard/Pasteboard	8.7%	2.6%	7.3%	10.1%
Newspaper	8.5%	5.0%	5.9%	11.1%
Office Paper/Junk Mail	6.7%	7.9%	2.6%	10.9%
Magazines/Catalogs	4.8%	3.5%	3.0%	6.6%
Polycoated/Aseptic Containers	0.6%	0.4%	0.4%	0.8%
Phone Books	0.1%	0.4%	<0.1%	0.3%
Food Service Packaging	0.2%	0.2%	<0.1%	0.3%
Total Paper	44.3%	12.6%	37.7%	50.8%
PLASTIC				
#1 PET Bottles (with neck)	4.6%	0.9%	4.1%	5.0%
#1 PET Containers/Tubs (no neck)	<0.1%	0.1%	<0.1%	0.2%
#2 HDPE Bottles (with neck)	2.4%	0.9%	1.9%	2.9%
#2 HDPE Containers/Tubs (no neck)	0.2%	0.2%	0.1%	0.4%
#3-#7 Bottles and Containers (neck/no neck)	1.6%	1.0%	1.1%	2.2%
Total Plastic	9.0%	1.8%	8.0%	9.9%
METAL				
Aluminum Containers	1.4%	0.8%	1.0%	1.8%
Ferrous and Non-Aluminum Metal Containers	2.2%	1.0%	1.7%	2.8%
Aerosol Cans	0.4%	0.2%	0.3%	0.5%
Total Metal	4.0%	1.3%	3.4%	4.7%
GLASS				
Glass Containers (clear, brown, green)	4.5%	5.0%	1.9%	7.1%
Total Glass	4.5%	5.0%	1.9%	7.1%
NON-PROGRAM MATERIALS/CONTAMINATION	38.2%			
PLASTIC				
Plastic - Bags/Film	3.0%	2.3%	1.8%	4.2%
Plastic - Expanded Polystyrene	0.5%	0.6%	0.2%	0.8%
Plastic - Other (bulky, toys)	3.7%	2.2%	2.6%	4.8%
Total Plastic Contamination	7.2%	4.2%	5.0%	9.3%
OTHER				
Paper - Non-Marketable (coated, soiled)	2.3%	1.6%	1.5%	3.1%
Textiles/Clothing	3.7%	4.2%	1.5%	5.9%
Electronics	0.6%	1.3%	<0.1%	1.3%
Green Waste/Wood	3.9%	10.8%	<0.1%	9.5%
Tanglers (hoses, cables, wires, cords)	0.5%	1.0%	<0.1%	1.0%
Fines (materials <2 inches in diameter)	11.4%	6.2%	8.2%	14.6%
Other Non-Program Items	8.7%	8.2%	4.4%	12.9%
Total Other Contamination	31.1%	13.0%	24.3%	37.8%
	100.0%			

Note: Composition based on 10 samples

BAGGED MATERIALS

Since bagged materials pose significant challenges for material recovery operations, SCS/HSA recorded the number of bags in each sample. Bags that contained materials, regardless of size, were counted. Most bags contained unsorted municipal solid waste and not clean recyclable materials.

422 bags of materials, an average of 8.4 bags per sample, were torn open and sorted during this study. The number of bags used to contain materials varied across samples. For some samples, no bagged materials were recorded, while other samples contained more than 20 bags. Zones 4 and 5 were found to have fewer bags per sample than Zones 1, 2, and 3. **Table 11** summarizes the average number of bags used to contain materials in the samples sorted.

Table 11. Average Number of Bags Containing Materials by Zone per Sample

Collection Area	Average Number of Bags per Sample
Zone 1	10.6
Zone 2	10.0
Zone 3	8.8
Zone 4	6.8
Zone 5	6.0
Overall	8.4



Bagged Materials Separated from Sample and Ready for Counting and Sorting

Appendix A
Site Specific Health and Safety Plan

Specific Health and Safety Plan

Orange County Landfill/McCormick Recyclables Transfer Station

Project #: 092163200.37

Rev. – October 10, 2018

REQUIRED APPROVAL			
SCS OSHC or designee:	Kayla Ouellette (601)307-4252	Sign/Date:	<i>Kayla Ouellette</i> 10/31/2018
SCS PM:	Brent Dieleman (202) 841-9827	Sign/Date:	<i>Brent Dieleman</i> 11/2/2018

Project No.:	09213200.37
Project Name:	Orange County Landfill and McCormick Recyclables Transfer Station
Site Address:	5901 Young Pine Rd, Orlando, FL 32829 701 W McCormick Ave Apopka, FL 32703
Client Contact:	Jim Flynt, P.E. (407)-836-6605 (Orange County) David Reed (407)-466-1180 (Waste Management)

EMERGENCY TELEPHONE NUMBERS	
Fire:	9-1-1 or City of Orlando Fire Station 8 (407) 246-4408 (Landfill) 9-1-1 or Ocoee Fire Department (407) 905-3140 (McCormick)
Police:	9-1-1 or Southeast Community Police Office (407) 246-2470 (Landfill) 9-1-1 or Ocoee Police Substation Office (407) 905-3160 (McCormick)
Hospital	Florida Hospital East Orlando (407) 303-8110 (Landfill) Florida Central Health Hospital (407) 296-1000 (McCormick)
Ambulance:	9-1-1
SCS WorkCare	1-888-449-7787
The directions and information on the nearest hospital are found on Page 2-5	

ACKNOWLEDGEMENT PAGE

"I have read the attached Health and Safety Plan for **Orange County Landfill and McCormick Recyclables Transfer Station Composition Study** dated **October 10, 2018**. I have discussed any questions and/or concerns that I have regarding the contents of this document with the designated SCS project safety representative, and I understand its requirements."

	Name	Signature	Company	Date
①	CAREY TYRREX	Carey Tyrrell	People Ready	11-12-18
②	Diamond Lawrence	Signature	People Ready	11-12-18
③	Clifford Meaux	C. Meaux	People Ready	11-12-18
④	Trishawn Howard	Trishawn Howard	People Ready	11-12-18
⑤	KEVETT T. NICKLE	Kevett Nickle	Group Scientific	11-12-18
⑥	Katherine Sun	Young	SCS ENGINEERS	11-12-18
⑦	James Wilson	James Wilson	People Ready	11-13-18
⑧	Latoya Washington	Latoya Washington	People Ready	11-13-18
⑨	Shaundrick Adams	Shaundrick Adams	People Ready	11-13-18
	Brent Deleman	Brent Deleman	SBS	11/13/18
⑩	CORVARIUS TERRY	C. Terry	People Ready	11/14/18
⑪				

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Appendix A – Job Task Safety Analysis (JTSA)

Appendix B – SAFE Observation Form

1 INTRODUCTION

At SCS, protection of human health and the environment is paramount. This Site-Specific Health and Safety Plan (SSHSP) provides information to identify hazards that may be present and/or introduced by project's activities onto SCS job sites, and details needed precautions that employees should follow to protect themselves. Tasks performed on site or during projects should be analyzed to determine if physical or chemical hazards requiring safeguards or additional Personal Protective Equipment (PPE) exist. This plan will be modified as necessary if any new hazards are identified during the project that require that additional safeguards be put in place.

PROJECT ORGANIZATION

Project or Site Team Leader:	Brent Dieleman	(202)841-9827
Primary Health and Safety Representative:	Kayla Ouellette	(601)307-4252
Project Manager:	David Beben	(407)204-3241
Project Director	Shane Fischer	(813)503-1044
Client Representative:	Jim Flynt	(407)836-6605
Site Supervisor:	David Reed -	(407)466-1180

SCOPE OF WORK – RECYCLABLES CHARACTERIZATION

Recyclables characterization involves collecting field samples and sorting the recyclables into designated categories. The data that is generated from the field activities will be compiled and presented to Orange County.

There have been no reported serious or fatal incidents attributed specifically to the performance of recyclables characterization studies. However, accidents may occur due to the potential hazards associated with the presence of heavy equipment at the site, the components of the waste itself (potentially sharp objects, broken glass), climatic conditions, and carelessness.

The presence of heavy equipment in operation at the site (end loaders, transfer station compactors, garbage trucks, etc.) presents potential hazards which can be avoided with the use of general common sense and staying visible. The equipment operators generally are involved in performing their tasks and may be unaware of the presence of other individuals within the immediate area. Personnel will be trained to be aware of the movement and location of equipment at all times. Also, highly visible clothing, including safety vests and hard hats, is required.

The components of municipal solid waste present potential physical hazards. These include, but are not limited to, cuts from broken glass and sharp metal objects; splinters from pieces of wood; punctures from nails and other sharp objects; and scrapes and abrasions from the general

handling of the solid waste. There also exists the potential for exposure to household products, such as bleach, cleansers, and other toxic chemicals.

To alleviate the possibility of injury, caution should be employed at all times when physically handling the solid waste. Protective clothing, including gloves and safety glasses, should be worn at all times. If there is any question about the handling of a component of the recyclables, the Crew Chief should be notified.

The recyclables characterization will be performed outdoors under tents at the McCormick Transfer Station and inside the Recovered Materials Processing Facility at the Orange County Landfill. Caution should be taken to avoid the possibility of heat stress due to protective clothing or weather, or frostbite in areas of extreme cold.

Landfill gas (LFG) is produced by the anaerobic decomposition of organic waste materials placed in a landfill. LFG is typically composed of 50 to 60 percent methane, 40 to 50 percent carbon dioxide, and trace amounts of various other gases, including odorous and possible toxic compounds. For this study, the sort location at McCormick Recyclable Transfer Station is not expected to be a concern for generation of LFG. The other sort location adjacent to a closed landfill with a LFG collection network. The anticipated LFG concentration at the sorting area is anticipated to be minimal.

2 EMERGENCY RESPONSE AND MEDICAL TREATMENT PROCEDURES

Emergency Contact and Notification Information

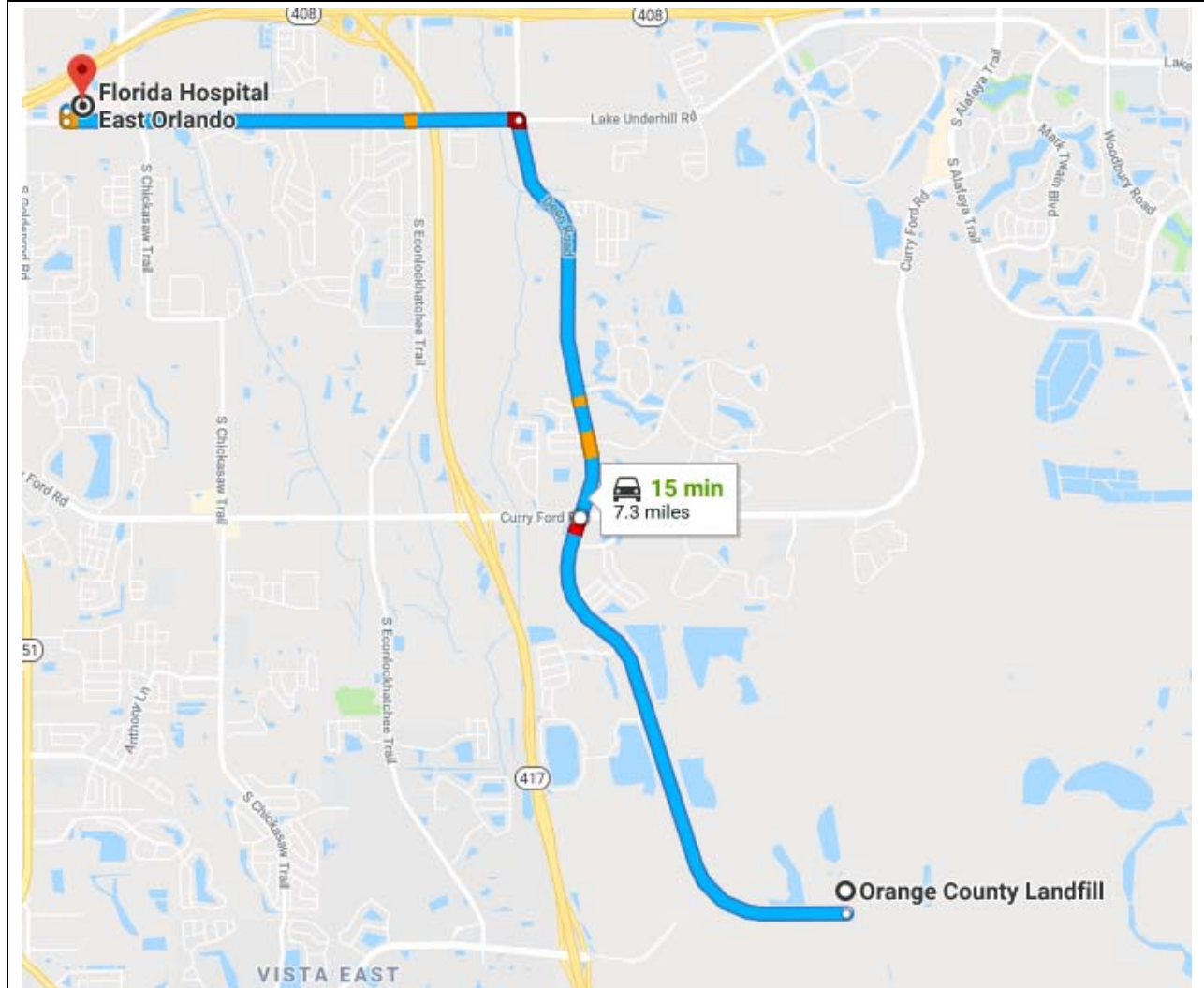


Figure 1. Map to the Hospital and Directions from Orange County Landfill

Nearest Hospital Address:

**Florida Hospital East Orlando
7727 Lake Underhill Rd
Orlando, FL 32822
407-303-8110**

Orange County Landfill

5901 Young Pine Rd, Orlando, FL 32829

- ↑ Head west on Young Pine Rd
⚠ Partial restricted usage road

2.8 mi

- ↑ Continue onto Dean Rd



2.1 mi

- ↶ Turn left onto Lake Underhill Rd

2.3 mi

- ↷ Turn right

285 ft

- ↷ Turn right

135 ft

Florida Hospital East Orlando

7727 Lake Underhill Rd, Orlando, FL 32822

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

EMERGENCY CONTACT AND NOTIFICATION INFORMATION

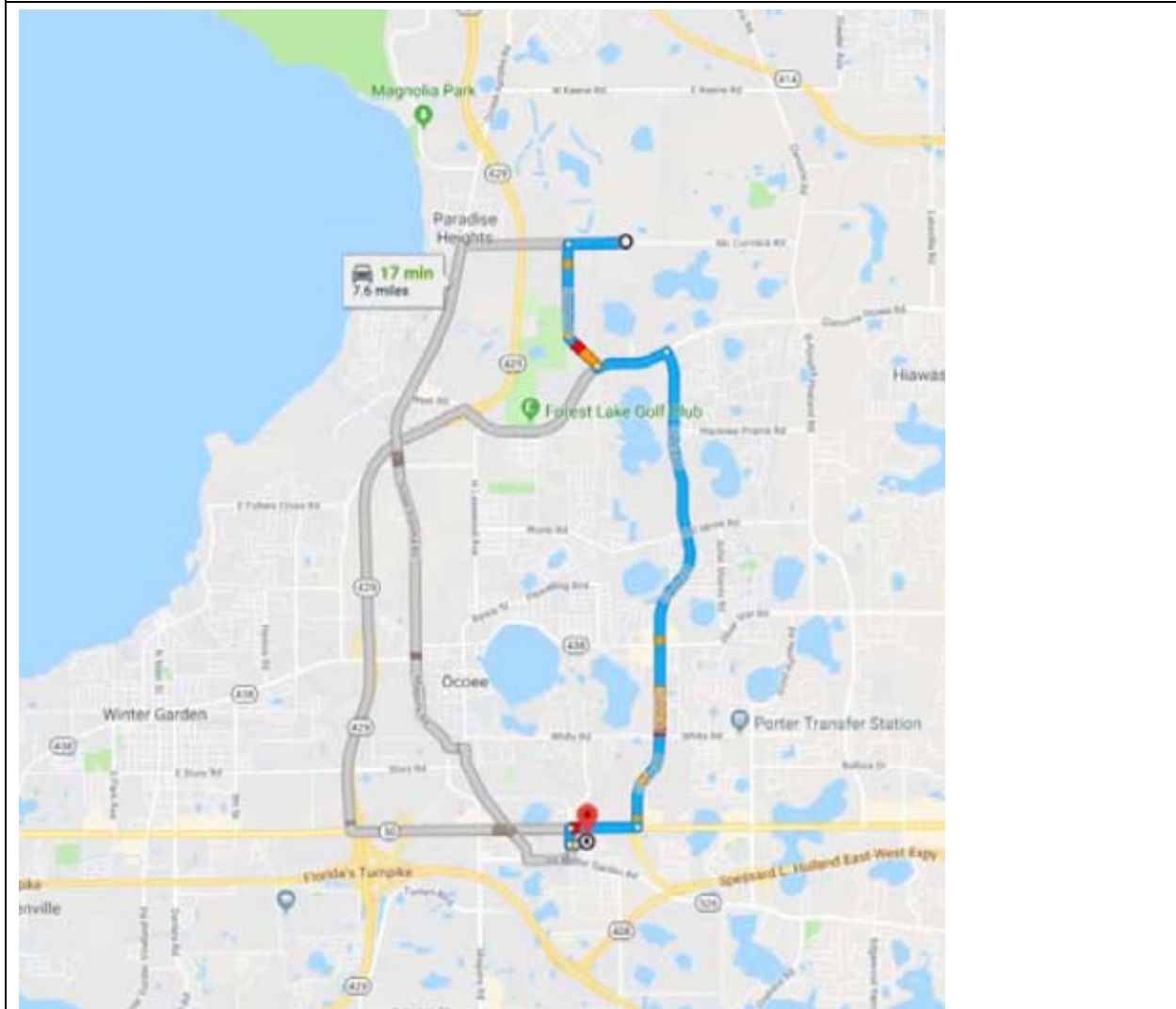


Figure 2. Map to the Hospital and Directions from McCormick Recyclables Transfer Station

Nearest Hospital Address:

**Orlando Health Central Hospital
10000 W Colonial Dr
Ocoee, FL 34761
(407) 296-1000**

701 W McCormick Rd

Apopka, FL 32703

Drive from N Clarke Rd to Ocoee

- 14 min (7.0 mi)
- ↑ 1. Head west on W McCormick Rd toward Marden Rd
0.5 mi
 - ↩ 2. Turn left onto Ingram Rd
1.1 mi
 - ↩ 3. Turn left onto Clarcona Ocoee Rd
0.6 mi
 - ↘ 4. Turn right at the 2nd cross street onto N Clarke Rd
① Pass by McDonald's (on the right in 2.5 mi)
4.1 mi
 - ↘ 5. Turn right onto FL-50 W/W Colonial Dr
0.5 mi
 - ↩ 6. Turn left onto Blackwood Ave
0.1 mi

Drive to your destination

- 1 min (0.1 mi)
- ↩ 7. Turn left
246 ft
 - ↑ 8. Continue straight
167 ft
 - ↘ 9. Slight right
① Destination will be on the right
138 ft

Health Central Hospital

10000 W Colonial Dr, Ocoee, FL 34761

ACCIDENT OR INCIDENT REPORTING SYSTEM

In the event of an emergency at the site, project personnel should call 911 for emergency assistance. After the immediate emergency situation has been addressed by emergency personnel, SCS project personnel should call the SCS Project Manager and the Client Representative and inform them of the situation. The Project Manager should evaluate the nature of the emergency and direct project personnel actions from that point.

NOTIFICATION PROCEDURES FOR INCIDENTS (CLIENT, LOCAL, STATE, OR FEDERAL)

Site personnel should contact their supervisor immediately when an accident or injury occurs, and provide any needed information so that additional notifications can be determined and completed as needed.

METHODS TO SUMMON EMERGENCY RESPONSE TEAM

Emergency services can be summoned through 911, as this service is active in the area.

RESCUE AND MEDICAL TREATMENT REQUIREMENTS

Stop work authority should be exercised when an injury or accident occurs. The appropriate emergency agency should be contacted and first aid administered, if possible. Contact Kayla Ouellette (601)307-4252 as soon as possible as well. If the injury is not life-threatening and does not require emergency response, contact WorkCare at 1-888-449-7787. First aid kits and fire extinguishers are available in each SCS work truck. Additional first aid or medical support is available in the scalehouse/trailer at the McCormick Transfer Station and in the office building at the Recovered Materials Processing Facility.

SITE EMERGENCIES

In the event of a site emergency, natural disaster or severe weather event, all personnel should evacuate the work area and meet at the main entrance. In the event of an emergency at the site, project personnel should call 911 for emergency assistance.

3 SITE DESCRIPTION

LOCATION DESCRIPTION

The Orange County Solid Waste Management Facility is an active landfill located at 5901 Young Pine Rd., Orlando, FL 32829. Orange County Solid Waste Management Facility which currently takes in approximately 2,500 tons of waste per day, is permitted by the Florida Department of Environmental Protection as a Class I and Class III Solid Waste. The site includes offices, scale, a citizen drop-off area, a yard waste mulching area, waste tire storage area, waste recycling facilities; borrow pits, maintenance areas, and other ancillary facilities.

McCormick Recyclables Transfer Station is located at 701 W. McCormick Ave Apopka, FL 32703. It serves as a transfer station for the County's residential recycling program.

4 GENERAL FIELD SAFETY PROCEDURES

General Standard Operating Procedures (SOPs) and additional SCS Health and Safety procedures and requirements are included in the current SCS Injury Illness Protection Program (IIPP) and on the SCS intranet. These documents are considered a part of this plan. SCS team members will conduct themselves in a professional manner at all times. The following restrictions will also be observed by all SCS personnel and subcontractors to SCS.

- Working while under the influence of intoxicants, narcotics, or controlled substances is prohibited.
- Smoking anywhere on site is prohibited.
- Loose clothing will not be worn on-site. Long hair will be worn up inside hard hat.
- Eating, drinking, chewing gum, smoking, or any practice that increases the probability of

hand-to-mouth transfer and ingestion of material is prohibited on-site, unless in designated break areas.

- No personnel will be admitted to the site without the proper safety equipment, clearance or other approval.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the Site Manager, will be immediately dismissed from the site.
- No unapproved work clothes or equipment will be allowed on-site.
- Prescription drugs should not be taken by personnel where the potential for contact with toxic substances exist. Use must be specifically approved by a qualified physician.
- Work areas for various operational activities will be established.
- Work areas will be established based on prevailing site conditions and are subject to change. Personnel should check with the Site Manager for current and appropriate procedures regularly.
- Contact with contaminated or potentially contaminated material should be avoided. Whenever possible, do not walk through puddles, mud, or any discolored ground surface. Do not kneel on the ground. Do not lean, sit or place equipment on drums, containers, or vehicles.
- Due caution will be observed when proceeding on foot through open areas. Personnel will not cross the line of cones that will separate the sorting area from the area where heavy equipment will be operating.
- Any medical emergency supersedes routine safety requirements.

APPLICABLE STANDARD OPERATING PROCEDURES (SOPS) AND PROGRAMS

	SOP Number and Name		SOP Number and Name
X	01 - General Code of Safe Work Practices		22 - Safe Procedures for Working with Sites That Contain Hydrogen Sulfide
X	04 - JTSA and PPE Assessment Procedures	X	24 - Avoidance of Slips, Trips, and Falls
	05 - Work Permits	X	25 - Avoidance and Prevention of Heat and Cold Stress, and Other Weather-Related Hazards

	SOP Number and Name		SOP Number and Name
X	06 - Forklift and Heavy Machinery Operations		26 - All-Terrain Vehicles and Watercraft
	07 - Compressed Air and Compressed Gas Cylinders		27 - OSHA and Other Regulatory Inspections
	08 - Drilling and Well Installation Procedures		
	09 - Electrical Safety		Appendix Letter and Program Name
	10 - Fall Protection	X	B - Hazard Communication
X	11 - Fire Extinguishers		C - HAZWOPER
	12 - Hand and Power Tools		D - Exposure Assessment
	13 - Working Safely with Ladders	X	E - PPE Other Than Respiratory Protection
	14 - Landfill Leachate and Condensate Safe Procedures	X	F - Respiratory Protection
	15 - Lockout and Tagout	X	G - Motor Vehicle and Fleet Safety
	17 - Materials Use and Handling		H - Hearing Conservation
	18 - Polyethylene (PE) Pipe Work Safe Procedures	X	I - Bloodborne Pathogens
X	19 - Site Sanitation Procedures		J - Excavation and Construction Earthwork Program
	20 - Safe Work Practices for Scaffolds		K - Confined Space Entry
X	21 - Safe Procedures for Biological Hazards (Snakes, Insects, Vegetation, Bacteria)		L - Ergonomics Program

JOB TASK SAFETY ANALYSIS (JTSA) AND PPE ASSESSMENT

JTSAs for activities performed at this site have been completed as indicated below and are included in **Appendix A**. A completed JTSA is required for all work tasks performed at the site. **JTSAs are designed to identify steps which involve potential hazards to employees and should be reviewed and understood (and signed providing evidence of understanding) before performing any task at the site. If additional steps or hazards are present, the JTSA should be revised (and the revision signed by all affected staff) to indicate that all items have been appropriately addressed and are understood before proceeding with the task.**

Unless identified in an attached Job Task Safety Analysis (JTSA) form, all project tasks are anticipated to only require **Level D** PPE, as defined by the Occupational Safety and Health Administration (OSHA). Prior to working in a Level C or B environment, each employee is required to be medically qualified (by an approved SCS medical provider) and properly fit-tested

for the needed respiratory protection defined in this plan. The project's designated primary health and safety coordinator will ensure that this is completed per SCS policy, with assistance, as needed, from the SCS Corporate Health and Safety Director (CHSD). IN ADDITION, ANY EMPLOYEE WORKING AT A SITE AS DEFINED IN 29 CFR 1910.120 (or applicable state OSHA standard) OR REQUIRED BY CONTRACT SHALL BE TRAINED IN ACCORDANCE WITH 29 CFR 1910.120(e) (24-hour or 40-hour HAZWOPER, as appropriate). Each employee will only perform tasks that they have been properly trained to perform. A copy of each employee's training record is available through the SCS OSHC or designee.

SCS field personnel (including subcontractors) will be informed in the use of safety equipment and will be required to wear protective clothing appropriate for the tasks in which they will be involved.

Extra equipment will be located on-site. This equipment will include the following items:

- Dust Masks
- Tyvek Coverall Suits
- Gloves (nitrile and HexArmor: SharpsMaster II)
- High Visibility Safety Vests
- Eye Protection
- Ear Protection
- Hard Hats
- First Aid Kit

Sufficient water for personal use will be brought on-site daily.

SAFE OBSERVATIONS

The SCS SAFE Observation Checklist will be used by field and project personnel. The goal is to make at least one (1) documented observation per quarter during site activities. A copy of a SAFE form is provided in **Appendix B**.

OTHER INSPECTION PROCEDURES

Periodic site inspections may be made by the CHSD, Project Supervisor, Project Manager, and Regional Compliance Auditor or Safety Specialist. There is also the potential for the client or regulatory agencies to visit and inspect the work area. SCS personnel are to perform tasks in compliance with all contractual, regulatory, and company requirements at all times.

SITE CONTROL

SCS and its subcontractors will be restricted to confined areas at both work locations (Recovered Materials Processing Facility and McCormick Transfer Station). These areas will be established at the start of the project. Under no circumstances are SCS employees or subcontractors to enter other buildings and areas of the Recovered Materials Processing Facility or McCormick

Transfer Station not authorized by the Project Leader or Client Representative.

Our clients are responsible for providing SCS employees and subcontractors with safe site access, which includes sites that are free of threats from transients or other aggressive people or animals. If an SCS employee encounters an aggressive person or animal, they should withdraw from the site and contact the Client Representative and their SCS supervisor. The Client Representative is responsible for removing the threats, and SCS employees should not take any affirmative action of their own.

DECONTAMINATION PROCEDURES

The risks of illness due to ingestion of diseased or decomposing materials from the work site are significant. To minimize these risks, all personnel should remove and store the outer layer of their protective clothing (i.e., coveralls, gloves, hard hat, etc.) on-site. Hands, face, and nails should be thoroughly washed, or scrubbed, with soap and water prior to engaging in any activity likely to transmit materials encountered on-site into the mouth. If waste materials come in contact with the skin, that crew member will be temporarily excused to thoroughly wash the affected area with soap and water. A washroom is available on-site.

HANDLING OF HAZARDOUS WASTE MATERIALS

Hazardous materials will be avoided during sample selection. If hazardous materials are encountered during the sorting activities, they will be segregated from the normal recycling streams and put in separate containers.

Caution will be taken when handling mercury-containing wastes such as fluorescent light bulbs. Care will be taken to not break the glass bulb, and to avoid samples with excess amounts of fluorescent light bulbs. Gloves and Tyvek suits will provide skin protection from mercury compounds.

Extreme care will be taken when segregating hazardous materials. If SCS personnel or subcontractors encounter material that may be considered hazardous, they will be instructed to report it to the Client Representative immediately.

HOUSEKEEPING REQUIREMENTS

Washroom facilities are located in the office building at the Recovered Materials Processing Facility and in the scalehouse/office trailer at the McCormick Transfer Station. SCS personnel and subcontractors must thoroughly wash their hands and arms prior to breaks and lunch. SCS personnel and subcontractors must verbally communicate with the Project Leader if bathroom breaks are required during sorting activities. .

Hand sanitizer will be made available to assist with decontamination. A designated break/lunch area will be established at the beginning of the project. SCS personnel and subcontractors must only consume food and drinks in the designated break area.

Each member of the project team is responsible for maintaining a clean, functional, and safe work area. This includes immediately cleaning up spills and not leaving equipment, such as containers, brooms, shovels, etc., in areas designated as walkways or in places where they create tripping hazards. SCS personnel and subcontractors must not throw recyclable materials and waste across the work area. Materials must be carefully sorted directly in designated containers.

5 SITE HAZARDS

Chemical and Physical Agent Hazards

The following chemical and physical hazards should be considered before performing any task or work at the site. The analysis will depend on a thorough understanding of the site's physical characteristics and the task(s) being performed.

Landfill Gas: Landfill gas (LFG) varies from one site to another. LFG consists primarily of methane (about 55 percent) and carbon dioxide (about 45 percent). Other components that may be present include water vapor, nitrogen, carbon monoxide, hydrogen sulfide, and other toxic compounds. LFG is flammable and potentially explosive.

Methane (CH₄): Methane gas is produced at landfills from the decomposition of waste. Methane is a colorless, odorless, flammable, and potentially explosive gas. The flammable range of methane is 5 to 15 percent by volume. Methane is a simple asphyxiate as it is capable of displacing oxygen. Personnel should wear an oxygen monitor when working in any area where gas may be present.

Toxic Compounds: Non-Methane Organic Compounds (NMOCs), as well as inorganic toxic contaminants such as mercury, and sometimes even radioactive contaminants such as tritium, may be present on a site. NMOCs include such toxic compounds as benzene, toluene, chloroform, vinyl chloride, carbon tetrachloride, and trichloroethane, which, although less than 1 percent by weight, are hazardous. These potential hazards should be evaluated on a case-by-case basis.

Hydrogen Sulfide (H₂S): Varies by site, but is typically present between 10 and 200 parts per million (ppm). Hydrogen sulfide can accumulate in low areas such as sumps, holes, ditches, or depressions. Hydrogen sulfide is a primary hazard in confined space entry. Personnel should wear an H₂S monitor to alarm when working in any area where gas may be present.

Leachate: The generation of leachate is caused mostly by precipitation. Once water percolates through waste, it reacts with the products of decomposition, chemicals, and other materials to produce leachate. Risks from waste leachate are due to its high organic contaminate concentrations and high ammoniacal nitrogen. Pathogenic microorganisms and toxic substances from waste are also health concerns. Methane and hydrogen sulfide may also be dissolved in the leachate. This could pose a concern in low ventilated areas where an explosion and/or exposure risk may develop. Workers should avoid direct contact with condensate. Where there is a risk of splashing, spilling, or spraying of condensate, appropriate measures should be taken to avoid contact with skin and eyes. These measures include wearing chemical protective goggles, face shield, gloves, apron, boots, or coveralls, as needed. In the event of direct contact, immediately remove any contaminated clothing and wash the affected area with soap and water. Ensure that all contaminated PPE and clothing are properly decontaminated. Avoid contact at all times.

LFG Condensate: LFG condensate is produced when LFG cools and moisture condenses from the vapor phase to the liquid phase. The condensate then collects in low points of the LFG collection system. It generally contains elevated levels of heavy metals (e.g., chromium) and has

a low pH (< 7.0). Pathogenic microorganisms and other hazardous substances can also be present. Methane and hydrogen sulfide may also be dissolved in condensate. This could pose a concern in low ventilated areas where an explosion and/or exposure risk may develop. Workers should avoid direct contact with condensate. Where there is a risk of splashing, spilling, or spraying of condensate, appropriate measures should be taken to avoid contact with skin and eyes. These measures include wearing chemical protective goggles, face shield, gloves, apron, boots, or coveralls, as needed. In the event of direct contact, immediately remove any contaminated clothing and wash the affected area with soap and water. Ensure that all contaminated PPE and clothing are properly decontaminated. Avoid contact at all times.

Poisons: Pesticides, cleaners, or other toxic materials of various types may be present in the waste and recycling streams. Avoid contact with these items. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove any contaminated clothing, and wash with hot soapy water any skin that becomes contaminated. Avoid contact at all times.

Flammables: Fuel such as gasoline and diesel can be present at solid waste facilities. Additionally, paint thinners or other flammable materials may be present in the waste and recycling streams. The primary risk associated with these materials is fire. Keep all ignition sources away from flammable materials. Do not smoke, unless in designated areas. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove any contaminated clothing, and wash with hot soapy water any skin that becomes contaminated. Avoid contact at all times.

Oxidizers: Fertilizers, pool chemicals, chlorine, or other oxidizers may be present in waste and recycling streams. The primary risk from oxidizers is an increased fire potential. Keep fire and fuel or oil away from oxidizers. Do not smoke, unless in designated areas. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove any contaminated clothing, and wash with hot soapy water any skin that becomes contaminated. Avoid contact at all times.

Corrosives: Acidic and caustic materials may be present in waste and recycling streams. The primary risk from corrosives is damage to the skin or eyes. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove any contaminated clothing, and wash with hot soapy water any skin that becomes contaminated. Avoid contact at all times.

Physical Hazards

The following physical hazards should be considered before performing any task or work at a solid waste facility. Depending on the task(s) being performed, any or all of these hazards may be present.

Heavy Equipment: Compactors, bull dozers, loaders, track hoes, forklifts and large trucks, and other vehicles are present at solid waste facilities. Loud noise and limited visibility can increase the threat of being run over or crushed by these vehicles. Wear high-visibility vests (recommend Class III) and coordinate with vehicle operators when working in the vicinity of these pieces of

equipment. Heavy equipment hazards are especially present at or near a landfill's working face, on tipping floors, near scalehouses, and on access roads. When working in these area(s), equipment operators must be notified. These vehicles should not be operated within 50 feet of a person on foot. The use of a second person (as a spotter) should be done when working in this area. Only trained personnel should operate heavy equipment.

High Pressure: Gas or liquids in pipes or cylinders can pose hazards related to the pressure that may exist in the vessel. Any vessel or conveyance that has the potential to contain pressurized liquid or gas must be carefully evaluated before performing work. Do not cut or open a vessel or pipe until it is verified that the pressure has been released or eliminated. Wear proper protective equipment (safety glasses, face shield, gloves, apron, or coveralls) as needed to provide a barrier from contact with materials. The presence of flammable gas or liquids presents additional hazards from fire or explosion. All sources of ignition should be eliminated when working with these materials.

Steep and Uneven Terrain: Treacherous footing on slopes (i.e., sandy soil/clay), heavy equipment, or wildlife that could be present on slopes or in bushes all present hazards at disposal sites. Walking, driving, or operating heavy equipment on steep hills or uneven terrain can be dangerous. These areas should be avoided whenever possible. When it is necessary to walk or drive in such locations, great care should be taken. Move slowly and be aware of loose materials or holes that could be present. Sharp items or spilled materials may also exist and should be avoided. When traversing steep terrain, drive straight up or down slopes to reduce the possibility of roll over. Holes, pits, and ditches may be present. Falling or driving into these hazards can be avoided by becoming familiar with the site. Tall grass or vegetation can hide these features.

Do not drive on areas with which you are not familiar. Discuss access routes and hazards with the Client Representative. A good rule of thumb for driving is: "When in doubt—get out."

Lakes and Ponds: Water or leachate ponds and lakes may be present at solid waste facilities. Drowning can occur in only a few inches of water. The sides of ponds, lakes, and ditches containing water or leachate can be slippery. These areas should not be accessed unless necessary for tasks being performed. The use of approved flotation devices is required when working near any water body. A second person (buddy system) should be used when working in areas where water hazards are present.

Electrical: Electrical hazards at solid waste facilities fall into two categories. The first category includes underground or overhead electrical power lines that may be encountered. The location of all electrical power lines should be determined before any digging or excavation is performed. The presence of overhead electrical power lines should be determined so that contact with tall equipment (loaders, track hoes, etc.) can be prevented. Contracted locater services and/or physical protective measures (barriers or line covers) should be used as needed.

The second category of electrical hazard at solid waste facilities includes working on energized (powered) equipment or systems. Projects that may involve exposure to any form of hazardous energy, including electrical energy, must be performed in compliance with requirements described in **SOP 9** (Electrical Safety) of the SCS Health and Safety Program Manual. Special care should be taken while working in wet areas where electrical power is present. Activities

occurring in proximity with electrical power require that extreme caution be exercised to avoid accidental contact with pipes, ladders, tools, or body parts.

Lightning: The danger of lightning strike is increased when work occurs on the elevated surface of a solid waste facility. Lightning can strike miles ahead of a storm when no rain is present. All outside project work should be stopped immediately when lightning is visible or thunder is audible. All personnel should seek shelter off the elevated surface of the solid waste facility and remain inside a building (primary) or vehicle (secondary) until the danger passes. Do not take shelter near tall objects such as power lines, trees, antennas, or the flare stack. Work can resume when the lightning is no longer visible and the thunder cannot be heard.

Heat-Related Injuries: Elevated body temperatures can cause serious injury or death. Working outdoors, in the sun, or in a non climate-controlled facility increases the chance of heat-related injuries. This hazard is especially critical when PPE (such as coveralls or rain gear) is worn, since heat from the body becomes trapped inside clothing. Personnel should drink plenty of liquids and take breaks as needed. The following describes the various **Heat Disorders and Health Effects:**

- **Heat Stroke:** This disorder occurs when the body's system of temperature regulation (e.g., sweating and evaporation) fails and body temperature rises to critical levels. The condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a serious hazard. Primary signs and symptoms are confusion, irrational behavior, loss of consciousness, convulsions, a lack of sweating (usually), hot, dry skin, and an abnormally high body temperature. If a worker shows signs of possible heat stroke, call 911 to obtain **immediate** medical assistance. The worker should be placed in a shady area, and his or her outer clothing should be removed. The worker's skin should also be wetted and air movement around the body increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible--by mouth only if the worker is conscious. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment. Regardless of the worker's protests, **no** employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.
- **Heat Exhaustion:** The signs and symptoms of heat exhaustion include clammy skin, headache, nausea, vertigo, weakness, thirst, and giddiness. Fortunately, heat exhaustion responds readily to prompt treatment. This condition, however, should not be dismissed lightly, for several reasons. One is that fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended. The victim could also be injured when he or she faints. While the signs and symptoms associated with heat exhaustion are similar to those of heat stroke, the notable difference (with heat exhaustion) is clammy skin. Workers suffering from heat exhaustion should be removed from hot environments and given fluid replacement, by mouth only if the workers are conscious. They should also be encouraged to get adequate rest.

- **Heat Rashes:** The most common problem occurring in hot work environments is heat rash. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, the papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and papules may become infected if they are not treated. In most cases, heat rash will disappear when the affected individual returns to a cool environment.
- **Heat Fatigue:** One factor that predisposes individuals to heat fatigue is the lack of acclimatization. Use of a program of acclimatization and training for work in hot environments are advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, high-concentration, or high-vigilance activities. The sole treatment available for heat fatigue is to remove heat stress and increase fluid replacement before a more serious heat-related condition develops.

Cold-Related Injuries: In winter weather conditions, there is a potential for injury from cold, including dehydration, frostbite, heavy shivering, excessive fatigue, drowsiness, irritability, and euphoria. If workers show these symptoms, work should cease and affected personnel rest in heated buildings or vehicles.

Biological Hazards

Rodents, poisonous insects, snakes, other animals and/or plants are a natural part of any ecosystem. They are sometimes difficult to eliminate or avoid on some solid waste facilities because those sites are rural and remote. Employees should be aware of the potential for encountering these types of animals and plants. Where possible, nesting places should be removed or access to them should be limited. If several infestations occur, remedies should be discussed with a supervisor and the client (see **SCS IIPP, SOP-21**, for precautions and treatment for biological hazards). The following could be encountered in performance of the operation, maintenance, and monitoring functions of a project:

Hantavirus: Infection typically occurs by the inhalation of tiny airborne droplets of fresh or dried rodent excretions. Transmission to humans may also occur through direct contact with rodents or rodent-contaminated materials, and ingestion of contaminated food or water is also a possible route of transmission. Sweeping or “shaking out” rodent-contaminated materials should be avoided unless performed using respiratory protection. The early symptoms of hantavirus disease are flu-like (fever, chills, muscle aches). For a very short period of time, the infected person starts to feel better. Then, within 1 to 2 days, he or she may develop shortness of breath. The disease gets worse quickly and leads to respiratory failure, a condition known as Hantavirus Pulmonary Syndrome (HPS). About half of all HPS patients experience these symptoms, which usually occur 1 to 5 weeks from contracting the illness.

Lyme Disease: A tick-borne bacteria that causes a range of debilitating symptoms (i.e., flu-like discomfort, joint pain, fatigue, headache, lack of concentration, facial paralysis). The most outstanding symptom of the disease is a bulls-eye rash from the tick bite. Personnel should avoid areas known to harbor ticks, and use insect repellent containing DEET to limit the possibility of being bitten.

Mosquitos/No-see-ums: Mosquitoes suck blood to obtain proteins and other nutrients necessary for egg development, so only female mosquitoes "bite" or sting.. Once it locates a host, the female will probe the skin for a blood capillary then insert its very thin and sharp proboscis through the skin into the blood vessel and begin sucking blood. In the process, the mosquito will inject a small amount of saliva, which functions both as a lubricant for proboscis insertion and as an anticoagulant (prevents blood clotting). It is the proteins in the saliva that evoke an immune response and cause the swelling and itching. When a mosquito bites someone, it does not inject its own blood or the blood of an animal or person it has bitten before into the next person it bites. Salivary fluid injection and blood uptake occur through separate passageways. Diseases are transmitted only if the disease organism reproduces in the mosquito, or at least survives long enough to infect the salivary glands.

No-See-Ums are also referred to as Biting Midges, Biting Gnats, Punkies or Sand Flies. They are so small they can get through screens on windows and doors. Besides causing painful bites, they can also be vectors of diseases, particularly in tropical regions. Even if a No-See-Ums is not a vector of disease, it can still be a pest, ending up in a person's mouth, nose, ears and eyes.

If you are bitten, avoid scratching the bites. This could lead to infection. Mosquito/ no-see-um bites are best treated by washing with a mild soap solution and applying over the counter calamine or cortisone containing lotions. Scratching the area should be avoided. A few people may be severely allergic to mosquito bites and should seek medical attention if dizziness or nausea occur.

Mosquito bites can be avoided in several ways:

- Remove all water holding containers that may serve a mosquito breeding sites. If containers can't be removed, drain them and cover them so that they don't collect water, or flush every 2 or 3 days.
- Avoid outdoor activities when mosquitoes are most active. Specific times vary with the mosquito species, but the hours around dawn and dusk are particularly important.
- Wear protective clothing (long sleeves, socks and long pants).
- Use insect repellent. The most effective insect repellents are those that contain DEET. DEET is the abbreviation for the chemical N,N-diethyl-meta-toluamide. DEET has been sold in the United States since 1956 and is used by 50-100 million people each year. It repels mosquitoes, biting midges, fleas, ticks, horse flies, deer flies and chiggers. Repellents containing DEET are available as pump sprays, aerosols, lotions, creams, soaps and sticks.

Zika Virus: Zika is a mosquito-borne virus that has been reported in several places in the continental US (specifically Miami-Dade County, Florida and Brownsville, TX). Zika virus is transmitted to people primarily through the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus). These are the same mosquitoes that spread dengue and chikungunya viruses. Zika can also be passed through sex, even if the infected person does not have symptoms at the time.

Many people infected with Zika virus won't have symptoms or will only have mild symptoms. Zika virus usually remains in the blood of an infected person for about a week. Signs and symptoms of Zika include:

- Fever
- Rash
- Headache
- Joint pain
- Conjunctivitis (red eyes)
- Muscle pain

Zika infection during pregnancy can cause a birth defect of the brain called microcephaly and other severe brain defects. It is also linked to other problems, such as miscarriage, stillbirth, and other birth defects. There have also been increased reports of Guillain-Barré syndrome, an uncommon sickness of the nervous system, in areas affected by Zika.

No vaccines exist to prevent Zika. There are steps to take to protect yourself from mosquito bites:

- These mosquitoes typically lay eggs near standing water in things like buckets. They prefer to bite people, and live indoors and outdoors near people.
- Mosquitoes that spread chikungunya, dengue, and Zika bite during the day and night.
- Mosquitoes become infected when they feed on a person already infected with the virus. Infected mosquitoes can then spread the virus to other people through bites.

If you or your partner have recently traveled to Miami-Dade County, Florida or Brownsville, Texas or other areas and countries with Zika warnings and exhibit symptoms of Zika, talk to your SCS H&S representative or SCS Site Team Leader.

Ticks: Small arachnids that are larger than mites and come in a variety of forms and sizes. Ticks attach themselves to warm-blooded animals and extract blood from the host. It should be noted that ticks harbor at least two diseases:

- **Rocky Mountain Spotted Fever** is carried by some ticks and can be fatal. Symptoms can include fever, headache, and chills, experienced a few days after being bitten by a tick. Wood ticks can carry this disease.
- **Lyme Disease** is usually carried by the small deer tick. It may take as long as 72 hours of feeding to transmit infection, so brief contact with such ticks should not be cause for alarm. Symptoms may include red rash around the point of entry and/or flu-like ailments. Antibiotics are usually effective in relieving symptoms and in preventing progression of the disease to more serious stages. If left untreated for weeks or months, Lyme Disease can cause serious nerve and heart ailments, such as meningitis and myocarditis. Months or years after initial infection, affected people may develop arthritis that can last for

years. If you are concerned about exposure to this disease, you can request that you be tested for this disease through your OHSC.

Ways to protect yourself from ticks:

- When in the woods, wear clothing that covers the skin and fits snugly around the wrists, ankles, and waist. In areas known to heavily infested, openings at the pant legs and wrists should be sealed with duct tape. Avoid contact with vegetation such as tall grasses and bushes as ticks may transfer from these locations on to you.
- Wear light-colored clothing to make it easier to spot ticks.
- Use tick repellents (DEET) when working in areas known or suspected to be tick-infested.
- Apply tick repellent to clothing, concentrating on areas most accessible to ticks (for example, shoe tops, socks, and pant cuffs).

After being in a tick-infested area, check closely for any small ticks on the skin (especially the scalp and hair) and clothing. Ticks not completely removed can increase the likelihood of infection. If you find an attached tick, remove it, exercising care not to squeeze the insect's abdomen, since this may cause expulsion of fluids into the wound. The following procedures can be effective in removing ticks:

- Use tweezers to **slowly** pull the tick out of the skin.
- Grasp the tick as close to the skin as possible before removing.
- **Do not** attempt to burn the tick off with matches or hot objects.
- **Do not** attempt other home remedies, such as coating ticks with Vaseline.
- Contact WorkCare (888.449.7787) if you have difficulty in removing the tick or at the first sign of symptoms.

Chiggers: These are red six-legged mite larva approximately the size of a pinhead. Chiggers suck blood and cause intense itching or irritation. To eliminate chiggers, methods outlined above for protecting against ticks can be effective. Flowers of sulfur (sulfur powder sold in drugstores) are known to be chigger repellent.

Fire Ants: Any of a genus (*Solenopsis*) of fiercely stinging ants. Fire ants got their name because their sting literally burns like fire. Fire ant venom is much more potent than other insects' venom in that it contains a high concentration of piperidine, an alkaloid compound with a high pH that is 95% insoluble in water. Piperidine is related to piperine, the main active ingredient in black pepper. Fire ant venom also contains a smaller amount of protein than is normally found in stings.

- Do not disturb any ant mounds or nests as the ants will leave the nest or mound and climb up anything they find.
- If fire ants do crawl onto your skin, they first bite with their mandibles in order to anchor for the thrust of the sting. As soon as you feel this pinching sensation, quickly sweep the ants off before they actually sting and you can avoid most of the damage from an ant sting.
- Immediately after being stung, wash off the area with alcohol, try not to scratch it so it doesn't get infected. Sometimes a white pustule will form the second day, but it will eventually be resorbed. Apply a hydrocortisone cream to the sting area to reduce inflammation. A thick paste of baking soda and water can also help right after the sting. Careful application of ice will help decrease pain, but can burn the skin if left on too long. If the pustule becomes infected, apply an antibiotic cream and keep the area clean and contact WorkCare (888.449.7787). Antihistamines may help with local reactions: burning and itching.
- If other reactions occur soon after the stings, i.e., difficulty breathing, itchy rash, loss of consciousness, etc., get the person to an emergency room immediately and then contact WorkCare (888.449.7787). About 1% of the population have the potential for serious and dangerous reaction to fire ants. A physician can prescribe a single dose epinephrine auto injector device to carry with you in case of subsequent ant stings and anaphylactic reaction.

Bees and Wasps: Some people are highly allergic to stings from these insects (if so, those people should ask a physician for an emergency sting kit, and carry it at all times). The following are first aid procedures for bee or wasp stings:

- Remove the stinger by scraping it out with the edge of a knife blade, tweezer tips, or similar device. **Do not** squeeze the stinger.
- **Do not** use tweezers to grasp the stinger to remove it, as this may inject more poison.
- Cover the wound, apply a cold pack, and watch for allergic reaction (note: stingers remaining in the body are a problem with respect to bee stings, but not wasp stings).
- Contact WorkCare (888.449.7787) or seek medical attention if an allergic reaction occurs.

Africanized Honey Bees: This species of bee is aggressive and unpredictable. It responds quickly and stings in large numbers; senses threats from people or animals 50 feet or more from the nest; senses vibrations from power equipment 100 feet or more from the nest; swarms frequently to establish new nests; pursues an enemy 3 miles or more; and nests in small cavities and sheltered areas. It is almost impossible for an untrained person to tell the difference between honey bees and Africanized honey bees, therefore, avoid any and all areas known to contain bees. Notify your supervisor if you spot a bee nest.

Spiders: Venomous spiders indigenous to the Southeast include Black Widows and the Brown Recluse:

- **Black Widows** are shiny black spiders with long legs, approximately 2 inches in size. Females have an hourglass-shaped red mark on the underside of their abdomens.
- **Brown Recluses** are brown spiders approximately 1 to 2 inches in size. They have long legs and a distinctive dark brown fiddle-shaped marking on the underside. These spiders produce a dangerous necrotizing agent.



Snakes: Many different species of snakes are commonly found near the Recovered Materials Processing Facility since it is located next to a nature preserve. Rattlesnakes, vipers, and coral snakes are poisonous. Not all rattlesnakes give audible warning before they strike. Extra caution should be taken if tools or other materials are dropped in highly vegetated areas, around rocks, into stockpiles of pipe or other objects, or when walking through highly vegetated areas where visibility (of the ground) is limited. The most active times for snakes are morning, late afternoon, and early evening; however, encounters could happen at any time of the day. Walking loudly, shuffling feet, or making noise while working is recommended. Boots that reach mid-calf or snake guards are recommended.

Venomous Snakes: Eastern diamondback rattlesnakes, dusky pigmy rattlesnakes, copperheads, cottonmouths/water moccasins and coral snakes are venomous snakes common to the area. Not all rattlesnakes give audible warning before they strike.



Eastern Diamondback Rattlesnake



Cottonmouth/Water Moccasin




Copperhead



POISONOUS PLANTS

Poison ivy, poison oak, and poison sumac cause a short-lived but extremely irritating allergic form of contact dermatitis. The leaves, stems, and roots of these plants contain the resin urushiol, even small amounts of which on exposed skin can trigger an inflammatory allergic reaction. Urushiol can be transferred by fingers or animal fur, and can remain on clothing, shoes, and tools for a number of months. Urushiol particles can also travel in the wind when the plant is burned in a fire. Scratching the rash does not spread the poison to other parts of the body, but can prolong discomfort and cause a secondary infection.

The rash from urushiol generally develops within 2 days, peaks after 5 days, and starts to decline after about a week or 10 days. While some people survive exposure without ill effects, complete immunity is unlikely. People who seem immune from poisonous plants at one time and place may find themselves vulnerable in other situations. Of primary concern are:

- **Poison Ivy:** A plant (*Rhus toxicodendron*) characterized by leaves arranged in threes, ranging from less than a foot to 5 feet in height when the plant is free standing or taller when climbing. Poison ivy has greenish flowers and white berries, and its leaves turn yellow in the fall. When oils from the plant contact skin, they can produce a rash and intense dermal itching. 
- **Poison Oak:** Characterized by alternate leaves with three or occasionally five veined, shiny leaflets, poison oak thrives throughout the United States. In autumn, the leaves turn a deep red color. Exposure to the oily sap contained in all parts of the poison oak (roots, stem, leaves, flowers, and the fruit [berries]) may cause skin irritation ranging from mild to severe. Between 50 and 85 percent of the population is allergic to poison oak, resulting in a more severe reaction when exposed. Primary contamination results from contact with bruised or broken plant parts that release toxicodendrol, an oily resin containing urushiol. Because the lacquer-like resin does not dissolve in water, it is difficult to wash off and its toxicity persists for a long time. 
- **Poison Sumac:** A shrub (*Toxicodendron vernix*) characterized by pinnate leaves that have red stems and leaf veins, clusters of greenish yellow flowers that produce ivory-white fruit with a fleshy outer skin, and poisonous oils that irritate the skin. 

Treatment for Exposure to Poisonous Plants

If you think you have been exposed to poison ivy, oak, or sumac, wash all exposed areas thoroughly. If you can do this within five minutes of contact, you may often avoid allergic reaction. You can also treat most cases of the rash with applications of calamine lotion, Burrow's

Solution, or over-the-counter topical remedies containing antihistamines or hydrocortisone. Cold compresses--15 to 30 minutes several times a day--are useful for relieving itching and blistering; cool showers are also effective. A cortisone shot may relieve the itching, particularly within 24 hours of exposure.

Oral corticosteroids or antihistamines may also relieve the symptoms, but both drugs can have unwanted side effects. If you have complications from a severe case, you may need to see a doctor.

If you do contact any of these poisonous plants, be sure to clean your clothing, tools, or any gear that you may have had with you. Because urushiol can remain on clothing or other items for extended periods, touching these items can cause reinfection later.

Prevention of Exposure to Poisonous Plants

The best way to prevent exposure to poisonous plants is to learn to recognize these plants, and avoid contact with them. Barrier ointments or lotions from outdoor suppliers help if you are working around heavy vegetation.

Appendix A – Job Task Safety Analysis (JTSA)

Appendix B – SAFE Form

**JOB TASK SAFETY ANALYSIS AND PPE ASSESSMENT FORM-
JTSA-ES- 16- WASTE SORT**

Job Task Safety Analysis Form-01				
Task Type (Check all that Apply)	Solid Waste	Task Description (include an estimate of task duration in hrs/day) Three sort days at the Orange County Landfill and two sort days at the McCormick Recyclables Transfer Station, approximately 8 hours per day.	Location or Project: McCormick Recyclables Transfer Station and Orange County Landfill	
			Date Revised: 10/01/2018	
			Project #/Revision #: 09213200.36	
Analysis Team Member	Position Title		Reviewed by	Position Title
Brent Dieleman	Senior Project Professional		Kayla Ouellette	OHSC
Special Training Required		Bloodborne pathogens training		
Applicable SAFE Checklist(s): Specify type and category number		Environmental Services/Solid Waste Checklist		

This form is the certification that the hazard assessment has been performed for the workplace as required by 29 CFR 1910.132.

Job Task Step	Potential Environmental and Personnel Hazards ¹	Critical Actions	PPE Required
1. Drive to site, set up sorting table and containers.	Heavy lifting Slips/trips/falls Vehicle traffic	<ul style="list-style-type: none"> • Check in w/facility • Ensure work area is secured/isolated • Use buddy system • Employ safe lifting behaviors • Stretch/warm-up 	Head: Hardhat Body: Safety vest Foot: Steel--toe ANSI boots Hand: Nitrile + Leather outer glove Respiratory: None Hearing: None Eye/Face: Safety glasses
2. Collect recyclables samples from the tipping floor area	Heavy lifting Vehicle/HE traffic Slips/trips/falls Medical/bio waste Sharps Chemical exposures	<ul style="list-style-type: none"> • Use buddy system • Stay visible • Use safe lifting • Set up away from traffic • Give directions to bobcat operator • Avoid heavy EQ traffic 	Head: Hardhat Body: Safety vest Foot: Steel--toe ANSI boots Hand: Nitrile + Puncture Resistant Gloves Respiratory: Dust mask Hearing: Earplugs Eye/Face: Safety glasses
3. Hand-sort solid waste materials on the sorting table.	Heavy lifting Vehicle/HE traffic Slips/trips/falls Medical/bio waste Sharps Chemical exposures Stress/hygiene concerns	<ul style="list-style-type: none"> • Use buddy system • Stay visible • Use safe lifting • Set up away from traffic • Brush trash (vs digging) • Wash hands freq. • Stay hydrated • Shift breaks 	Head: Hardhat Body: Safety vest Foot: Steel--toe ANSI boots Hand: Nitrile + Puncture Resistant Gloves Respiratory: Dust mask (optional) Hearing: Earplugs (optional) Eye/Face: Safety glasses
4. Cleanup and Decontamination	Heavy lifting Slips/trips/falls Vehicle traffic	<ul style="list-style-type: none"> • Ensure work area is secured/isolated • Use buddy system • Employ safe lifting behaviors • Stretch/warm-up • Decontaminate PPE 	Head: Hardhat Body: Safety vest Foot: Steel--toe ANSI boots Hand: Nitrile + Leather outer glove Respiratory: Dust mask (optional) Hearing: None Eye/Face: Safety glasses
5. Demobilization	Vehicle/HE traffic	<ul style="list-style-type: none"> • Check out w/facility 	Head: None Body: High Visibility Vest Foot: Steel--toe ANSI boots Hand: None Respiratory: None Hearing: None Eye/Face: None

End of JTSA Form